Self-Assessments
on Concept (1.1)

Self-Assessment 1 On Lesson 1

1 **(A) Choose the correct answer :**

1. Animal cell differs from plant cell in ....
   a. shape only. b. structure only.
   c. shape and structure. d. neither shape nor structure.
2. Which of the following cells its length is greater than 0.1 mm ? ....
   a. Human skin cell. b. Unfertilized bird egg.
   c. Onion cell. d. Bacteria cell.
3. The new cells which are formed in your skin, come from other cells existed in ....
   a. your body. b. your father's body.
   c. your mother's body. d. your grandfather's body.

(B) Give a reason for the following :

We need to use a microscope to see the body of bacteria.

....

2 **(A) Put (✓) or (✗) :**

1. All cells have a cell wall in their structure. ( )
2. Not all animal cells have a nucleus. ( )
3. The cell membrane allows water to enter and exit from the cell. ( )

(B) What happens if ... ?

There is no food, oxygen and water found in the cell.

....

3 **Look at the opposite figures, then complete the following sentences :**

1. Structure .... is found in plant cells only.
2. Structure .... allows water to go inside and outside the animal cell.
3. Structure .... is found in most of animal cells, and is not found in some of them.

B
C
A

Self-Assessment 2 till Lesson 2

1 (A) Write the scientific term of each of the following :

1. The device which Robert Hooke used to observe the cells of plant parts. (....................)
2. A cell of a bird which we can see by our naked eye. (....................)
3. The objective lens of microscope which allow us to see the samples in bigger size. (....................)

(B) Give a reason for the following :

Robert Hooke used a microscope to observe the cells of plant parts.

....

2 (A) Correct the underlined words :

1. The body of a living organism that contains complex systems consists of one cell only. (....................)
2. The coarse focus and stage of microscope are used to make the image of the examined sample clear. (....................)
3. Growth of living organisms bodies happens by increasing the size of the cells that make up their bodies. (....................)

(B) What happens if ... ?

You examine a sample of some animal cells using the high power objective lens of microscope.

....

3 Look at the opposite figure, then complete the sentences below :

1. This device is called ....
2. Part number .... are used to form different degrees of magnified images of examined samples.
3. Part number .... is used to fix the slide on part number ....
4. We must look through part number .... to see the examined sample.

Self-Assessment 3 till Lesson 3

1 (A) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Nucleus	a. surrounds the plant cell from outside.
2. Cell membrane	b. is often located at the center of the cell.
3. Cell wall	c. is a thick liquid which is found inside the cell.
	d. surrounds the animal cell from outside.

1. .... 2. .... 3. ....

(B) Give a reason for the following :

Bacteria are unicellular organisms.

....

2 (A) Put (✓) or (X) :

1. Tissues is composed of different types of organs. ( )
2. The cell wall is made up of cellulose. ( )
3. Microscopes help scientists to observe large sized cells such as cells of bacteria. ( )

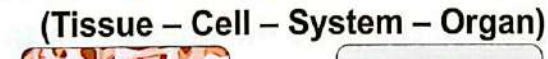
(B) What happen if ... ?

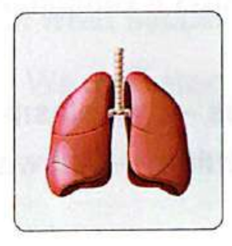
There is no mitochondria inside the cell.

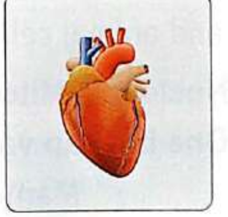
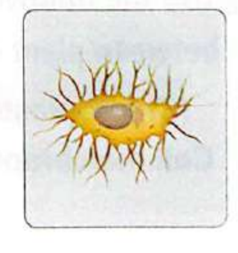
....

3 Look at the following figures, then answer the questions below :

(A) Write the name of each figure using the words below :





1. .... 2. .... 3. .... 4. ....

(B) Use the numbers in the figures above to show the correct arrangement of human body structure.





Human body

Self-Assessment 4 till Lessons 4&5

1 **(A) Complete the following sentences using the words below :**

(golgi apparatus – microscope – cellulose)

1. The rigid external material that surrounds the cell membrane in plant cell is made up of ....
2. A cell can transport some materials to another cell with the help of ....
3. We can see the structure of bacteria cells by using the ....

(B) Give a reason for the following :

The animal cell doesn't have a definite shape.

....

2 **(A) Correct the underlined words :**

1. Animal cell has one big vacuole called sap vacuole. (..................)
2. Mitochondria provide the cell with the needed food. (..................)
3. Stage clips in microscope have different focusing power to form different degrees of magnified images. (..................)

(B) What happens if ... ?

Chloroplasts cannot absorb the energy of sunlight.

....

3 **Use the following words to complete the table below that shows a comparison between plant cell and animal cell :**

(Chloroplasts – Nucleus – Mitochondria – Golgi apparatus – Cytoplasm – Cell membrane – One big sap vacuole – Endoplasmic reticulum – Cell wall – Many small vacuoles)

P.O.C	Plant cell	Animal cell
Differences :	....	....
Similarities :	....	

Self-Assessment 5 till Lesson 6

1 (A) Choose the correct answer :

1. The 3D microscope can show us the .... of the cells.
   a. sides and layers only b. layers and top only
   c. top and sides only d. top, sides and layers
2. The organelle which helps the plant cell to absorb the energy of sunlight to make photosynthesis process is ....
   a. sap vacuole. b. chloroplast.
   c. golgi appartus. d. endoplasmic reticulum.
3. Onion cells differ from human cells in the presence of .... in the structure of onion cells.
   a. cell wall b. nucleus c. mitochondria d. cytoplasm

(B) Give a reason for the following :

Some cell biologists work in agriculture.

....

2 (A) Write the scientific term of each of the following :

1. The part of the cell which is stained by methylene blue dye. (.....................)
2. Lenses which are found in microscope and have different magnification power. (.....................)
3. The gelatinous liquid which is found inside the cell. (.....................)

(B) What happens if ...?

We don't stain a sample of cheek cells before examining it under microscope.

....

3 Look at the opposite figure, then put (✓) or (✗) :

1. Part (a) is found in animal cell only. ( )
2. Part (c) is stained with blue color by methylene blue dye. ( )
3. Part (b) is found in both plant cell and animal cell. ( )
4. Part (d) gives the animal cell its definite shape. ( )

Plant cell

Model Exam

on Concept (1.1)

Total mark
15

1 (A) Choose from column (B) what suits it in column (A) : *(5 marks)*

(A)	(B)
1. Cell wall 2. Chloroplasts 3. Sap vacuole 4. Chlorophyll	a. stores nutrients, water and waste materials inside the plant cell. b. surrounds the plant cell to give it a definite shape. c. gives the animal cell its definite shape. d. are sac-like organelles that contain tiny green granules. e. absorbs the energy of sunlight to make photosynthesis process.

1. .... 2. .... 3. .... 4. ....

(B) Give a reason for the following :

Vacuoles act as storehouse in cities.

....

2 (A) Put (✓) or (✗) : *(5 marks)*

1. Cell biologists are scientists who study rocks. ( )
2. The cells of monkey are surrounded by cell membrane from outside. ( )
3. We can see the examined sample in bigger size when using the high power objective lens. ( )
4. All cells of human body have a nucleus. ( )

(B) What happens if ... ?

Sugar doesn't reach mitochondria inside a cell.

....

3 (A) Complete the following sentences using the words below : *(5 marks)*

(the cell – methylene blue – tissues – number)

1. To see the nucleus of a cell under microscope, we can stain the cell with .... dye.
2. Muscle organ is composed of a group of .... that do the same function.
3. Robert Hooke named the tiny particles that he saw under his microscope with ....
4. Your body grows up due to the increase in .... of your body cells.

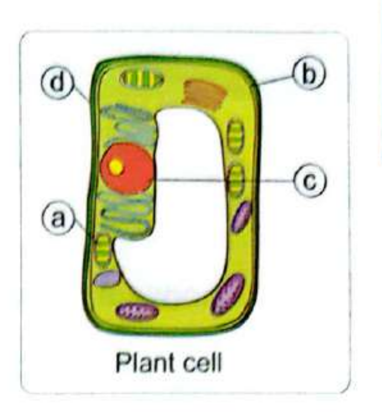
(B) Look at the opposite figure, then label it :

(a) ....

(b) ....

(c) ....

(d) ....



Plant cell

Model Exam on Concept (1.1)

Total ma
15

1 **(A) Choose the correct answer :** (5 ma

1. Growth of a living organism is resulted from increasing the .... of cells in its body.
   a. length b. size c. number d. mass
2. You can see the cells of all the following under microscope , <u>except</u> ....
   a. onion. b. human skin. c. leaf. d. stone.
3. The two cell organelles which are responsible for transportation process are ....
   a. mitochondria and golgi apparatus.
   b. endoplasmic reticulum and golgi apparatus.
   c. endoplasmic reticulum and mitochondria.
   d. mitochondria and chloroplasts.
4. The structure which is found in the cell of a banana tree leaf and not found in the cell of a cat is ....
   a. nucleus. b. golgi apparatus.
   c. cell membrane. d. cell wall.

(B) Give a reason for the following :

Plant cells can make photosynthesis process.

....

....

2 **(A) Correct the underlined words :** (5 ma

1. The coarse focus and <u>stage</u> of microscope are used to make the image of the examined sample clear. (..................
2. <u>Animal</u> cell has one big vacuole called sap vacuole. (..................
3. The body of living organism that contains complex systems consists of <u>one cell only</u>. (..................
4. Mitochondria provide the cell with the needed <u>food</u>. (..................

(B) What happens if ...?

There is no chloroplasts in plant cells.

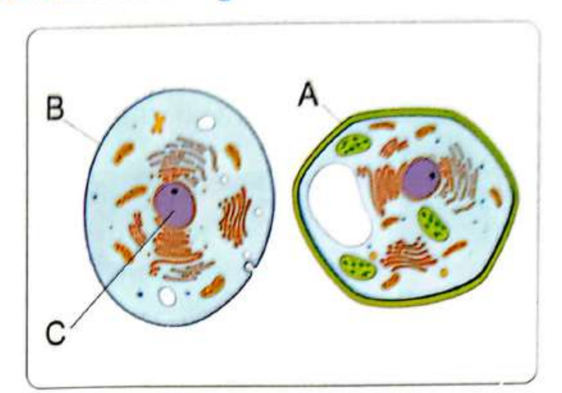
....

....

3 (A) Write the scientific term of each of the following : *(5 marks)*

1. The component of cell that allows water to enter and exit the cell. (..........................)
2. They are living organisms that their bodies consist of many cells. (..........................)
3. A stain that is used to color the nucleus of the cell in blue color. (..........................)
4. It is a green pigment which absorbs the energy of sunlight to make photosynthesis process in plants. (..........................)

(B) Look at the opposite figure, then complete the following sentences :



1. Structure .... is found in plant cells only.
2. Structure .... allows water to go inside and outside the animal cell.
3. Structure .... is found in most of animal cells, and it is not found in some of them.

Self-Assessments

on Concept (1.2)

Self-Assessment 6 On Lesson 1

1 (A) Choose from column (B) what suits it in column (A).

(A)	(B)
1. Circulatory system 2. Nervous system 3. Digestive system	a. is the system which responsible for providing the body with its needed nutrients. b. is the system which responsible for exchanging gas. c. is the system which responsible for transmitting nutrients to all the body parts. d. is the system which responsible for controlling the other systems in the body.

1. .... 2. .... 3. ....

(B) Give a reason for the following :

Nervous system helps circulatory system to do its function.

....

2 (A) Correct the underlined words :

1. <u>Respiratory</u> system provides the skeletal system with nutrients needed for growth. (......................)
2. When your eyes see a dangerous situation, the <u>heart</u> sends a signal to the muscles to contract. (......................)
3. <u>Digestive</u> system controls the muscles of heart. (......................)

(B) What happens if ... ?

Circulatory system cannot transmit the nutrients to the nerve cells.

....

3 **Look at the following pictures, then choose the correct answer :**



Organ (A)



Organ (B)

1. Organ (A) belongs to .... (respiratory system – circulatory system)
2. Organ (B) belongs to .... (digestive system – nervous system)
3. Organ .... helps in providing the body with its needed nutrients. (A – B)
4. Organ .... helps in transmitting the nutrients to all the body parts. (A – B)

Self-Assessment 7 till Lesson 2

1 **(A) Choose the correct answer :**

1. When muscle cells are collected together, they form muscle ....
   a. organs. b. tissues. c. systems. d. groups.
2. Among the organs of musculoskeletal system is the ....
   a. stomach. b. heart. c. lung. d. bone.
3. Nervous system depends on .... respectively in providing and transmitting the nutrients which are needed to do its function.
   a. digestive system and skeletal system
   b. circulatory system and respiratory system
   c. digestive system and respiratory system
   d. digestive system and circulatory system

(B) Give a reason for the following :

Skeletal muscles are attached to the bones of fingers.

....

2 **(A) Put (✓) or (✗) :**

1. Muscle cells must work with thousands of other cells to be effective. (   )

2. In dangerous situations, each system in the body works separately from the other systems. ( )
3. When you pull a rope towards you, the muscle in front of upper arm relaxes. ( )

(B) What happens if ... ?

There is no muscular system in the human body.

....

3 Look at the opposite picture, then choose the correct answer :

1. The muscles in the back of upper arm contract in person number .... (1 – 2)
2. The muscles in front of upper arm contract in person number .... (1 – 2)
3. The two persons depend mainly on .... system to play this game well. (digestive – musculoskeletal)

Self-Assessment 8 till Lesson 3

1 (A) Complete the following sentences using the words below :

(contracts – muscles – hormones)

1. Endocrine system secretes .... to control the body temperature.
2. When you push the door out with your hand, the muscles in the back of your upper arm ....
3. In dangerous situations, the brain sends a signal to your .... to contract and face the danger.

(B) Give a reason for the following :

Skeletal muscles are considered as voluntary muscles.

....

2 (A) Put (✓) or (✗) :

1. Eye have involuntary muscles only. ( )
2. Muscle cells are bundled to form muscle organs. ( )
3. Nervous system depends on digestive system and circulatory system to do its function. ( )

(B) What happens to ... ?

The endocrine system when the human body face a danger.

....

3 **Look at the following figures, then mention the type of muscles (voluntary or involuntary) :**



Muscles of heart

1. ....

Muscles of arm

2. ....



Muscles of eyeball

3. ....

Self-Assessment 9 till Lesson 4

1 **(A) Choose from column (B) what suits it in column (A).**

(A)	(B)
1. Digestion process 2. Urination process 3. Excretion process	a. is the process in which excretory system collects the waste materials produced by cells and removes them from the body. b. is the process of converting the complex food into simpler substances that the body can use for energy and growth. c. is the process of taking oxygen gas and expelling carbon dioxide gas. d. is the process of expelling urine outside the body.

1. .... 2. .... 3. ....

(B) Give a reason for the following :

Importance of respiratory system in excretion process.

....

2 **(A) Correct the underlined words :**

1. Urea is formed due to the breaking down of <u>carbohydrates</u> inside the body cells. (....................)
2. Pancreas and gallbladder secrete their enzymes inside <u>stomach</u> to complete the digestion of food. (....................)
3. Skeletal muscles are considered as <u>involuntary</u> muscles. (....................)

(B) What happens if ... ?

Glycogen that is stored in liver and muscles when you are exposed to a danger situation.

....

3 **The following table shows three different systems and organs that share in the excretion process and their excretory products, Mention the name of each of them :**

System / Organ	The excretory product
System (A)	Carbon dioxide
System (B)	Urine
Organ (C)	Sweat

1. System (A) represents ....
2. System (B) represents ....
3. Organ (C) represents ....

Self-Assessment 10 till Lesson 5

1 **(A) Choose the correct answer :**

1. All the following muscles are considered as voluntary muscles, <u>except</u> muscles of ....
   a. forearm. b. heart. c. neck. d. upper arm.
2. What is the system that transports the waste materials from the body cells to the urinary system ? ....
   a. Respiratory system. b. Digestive system.
   c. Nervous system. d. Circulatory system.

3. Endocrine system secretes .... that control the body temperature and the blood pressure.

a. hormones   b. water   c. blood   d. urea

(B) Give a reason for the following :

People whose kidneys are not working well may get harmed.

....

2 (A) Write the scientific term of each of the following :

1. An organ which is formed from cardiac muscle. (......................)
2. A system which helps in secreting saliva inside the mouth during chewing of food. (......................)
3. It is the organ which transports the urine from the two kidneys to the bladder. (......................)

(B) What is the waste material that is produced from breaking down of proteins inside the body cells ?

....

3 Classify the following words in the table below :

(Urea – Blood cells – Water – Proteins)

Substances pass through nephrons	Substances cannot pass through nephrons
....	....
....	....
....	....

Self-Assessment 11 till Lesson 6

1 (A) Complete the following sentences using the words below :

(digestive – insulin – musculoskeletal)

1. Researchers work to develop the artificial pancreas to pump .... directly inside the body of diabetics.
2. Pancreas is the organ that belongs to endocrine system and helps the .... system in digestion process.
3. Bones, muscles, tendons, ligaments and cartilages belong to .... system.

(B) Give a reason for the following :

Some diabetics use insulin pump device.

....

2 (A) Cross out the odd word :

1. Esophagus – Heart – Stomach – Large intestine. (....................)
2. Lungs – Trachea – Diaphragm – Brain. (....................)
3. Gallbladder – Kidneys – Ureter – Urethra. (....................)

(B) What happens if ... ?

Pancreas cannot secrete insulin hormone in the blood of a person.

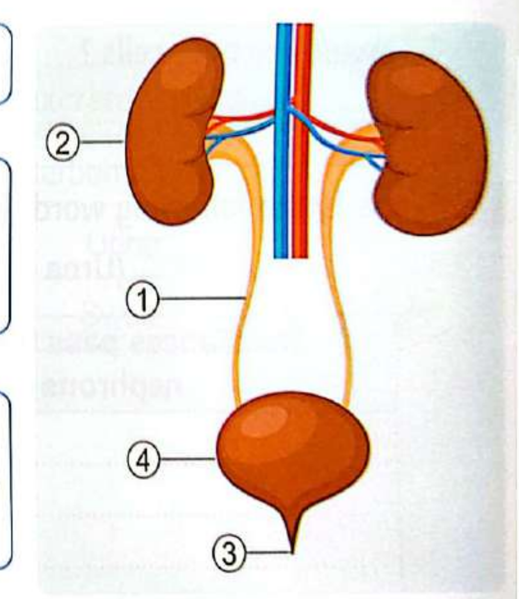
....

3 Look at the opposite figure, then complete the following diagram that explains the steps of urination process :

1. Blood is filtered in organ number ....

2. Then urine is transported to organ number .... by the help of organ number ....

3. The urine is stored in organ number .... until it is expelled outside the body by the help of organ number ....



Model Exam on Concept (1.2)

Total mark

15

1 (A) Choose the correct answer : *(5 marks)*

1. In dangerous situations, ...
   a. all systems of the body interact together.
   b. circulatory system interacts with digestive system only.
   c. nervous system sends a message to digest food in stomach.
   d. respiratory system interacts with circulatory system only.

2. All the following are happened by the help of endocrine system to face or to run away from danger, except ....
   a. contraction of your muscles. b. increasing your breathing rate.
   c. increasing your heartbeats. d. digestion of food that you eat.

3. All the following are responsible for excretion process, except ....
   a. digestive system. b. skin.
   c. respiratory system. d. urinary system.

4. Your leg moves due to contraction and relaxation of .... connected to the bones of leg.
   a. hairs b. toes c. skin d. muscles

(B) Give a reason for the following :

Undigested food becomes solid wastes inside the large intestine.

....

2 (A) Put (✓) or (X) : *(5 marks)*

1. People whose kidneys are not working properly must use other devices to filter their blood from waste. (   )
2. The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. (   )
3. The acid and enzymes which are secreted inside stomach lead to more breaking down of food. (   )
4. The muscles that help you move your eyes in [illegible] directions are considered as voluntary muscles. (   )

(B) What happens to ...?

The lungs when the diaphragm muscle contracts.

....

3 (A) Complete the following sentences using the words below : *(5 marks)*

(oxygenated – energy – sweat – muscles)

1. When you touch a sharp thorn, your hand moves away quickly due to the interaction between nervous system and .... in your hand.
2. Skeletal muscles can store and use .... quickly.
3. When your heartbeats and breathing rate increase, your body sends more .... blood to the muscles and brain to face the danger.
4. Some waste products leave your body in the form of .... through your skin.

(B) Look at the following figures, then complete the following sentences :


Figure (A)


Figure (B)

1. The forearm in figure .... moves up toward your shoulder.
2. The forearm in figure .... moves down away from your shoulder.
3. The muscles in front of the upper arm contract in figure .... and relax in figure ....
4. The muscles in the back of the upper arm contract in figure .... and relax in figure ....

Model Exam
on Concepts (1.1) & (1.2)



1 (A) Choose from column (B) what suits it in column (A) : *(5 marks)*

(A)	(B)
1. A group of similar cells form 2. A group of different tissues form 3. A group of different organs form 4. A group of different systems form	a. organs. b. cells. c. whole body. d. tissues. e. systems.

1. .... 2. .... 3. .... 4. ....

(B) Give a reason for the following :

You cannot see the body of bacteria with your naked eye.

....

2 (A) Write the scientific term of each of the following : *(5 marks)*

1. A device that is used to see the structure of living organisms cells. (...............)
2. A type of involuntary muscles which form the heart that contract and relax all time without stopping. (...............)
3. They are cell organelles that provide the cell with the needed energy. (...............)
4. A liquid in your mouth contains enzymes that help in digestion process. (...............)

(B) What happens if ... ?

The blood that carries waste materials passes through nephrons of the two kidneys.

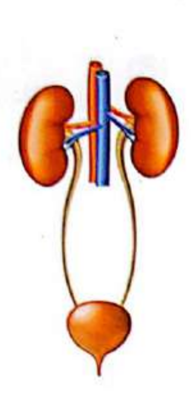
....

3 (A) Put (✓) or (✗) : *(5 marks)*

1. Proteins can pass through nephrons during filtration of blood in the kidneys. (   )
2. Bacteria and horse are considered as multicellular organisms. (   )
3. Nutrients reach the nerve cells which found in your hand by the help of circulatory system. (   )
4. There are many small vacuoles in the cells of a bird. (   )

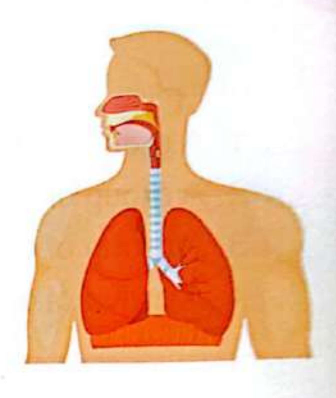
(B) Write each of the following organs below the system that belongs to :

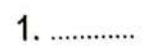
(Heart – Lungs – Kidneys – Stomach)











1. .... 2. .... 3. .... 4. ....

Concept 1 The Cell as a System

1 Summary of Concept 1

Cells • They are the basic units, or building blocks, of life on Earth.

Cells function:

» Cells carry out all the functions that organisms need to live, such as:

1. Growing
2. Repairing themselves
3. Reproducing
4. Responding to the environment

Cells size:

» **Most** cells are **very small**, so you will need a microscope to see them.

Examples: Plant cells – Animal cells – Bacteria cell

» **Some** cells are **very large**

Examples: An unfertilized bird's egg

NOTES:

- The unaided human eye can see objects that are about 0.1 millimeters (mm) long.
- Common plant or animal cells are between 0.005 and 0.1 mm long.
- Bacterial cells are smaller than plant or animal cells.

Cells number:

» Living organisms are classified according to the number of cells into:

1. **Unicellular organisms:**

   They are organisms made up of **only one** cell. **Ex.** Bacteria

2. **Multicellular organisms:**

   They are organisms that have **more than one** cell.

   Ex. Complex organisms, such as humans, animals and plants.

Basic Needs of a Cell:

- The basic needs of a cell are similar to the needs of all organisms, such as:
  1. Oxygen gas and food to get energy
  2. Water
- Cells have a way of **taking in** the needed materials and using them to get energy, grow, and live.
- Cells have a way of **releasing** waste products.
- It controls (regulates) which substances can enter or leave the cell.
- **The cell membrane allows water to enter the cell.** G.R
  Because water is a basic need for the cell to live.
- **The cell membrane allows water to leave the cell.** G.R
  To maintain the proper water balance on both sides of the cell membrane.

Organism Growth and Cells



- Living organisms grow and reproduce by increasing the **number** of cells.
- All new cells come from existing cells.



NOTES:

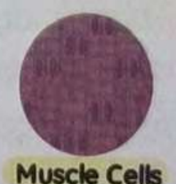
- The number of cells in living organisms varies.
- Humans have about 40 trillion cells.
- The body contains many different kinds of cells with different functions.
- Plants have a variety of cell types that perform photosynthesis or collect water and mineral nutrients.
- All cells consist of a cell membrane.
- Not all cells have a nucleus, such as red blood cells.



Blood Cells

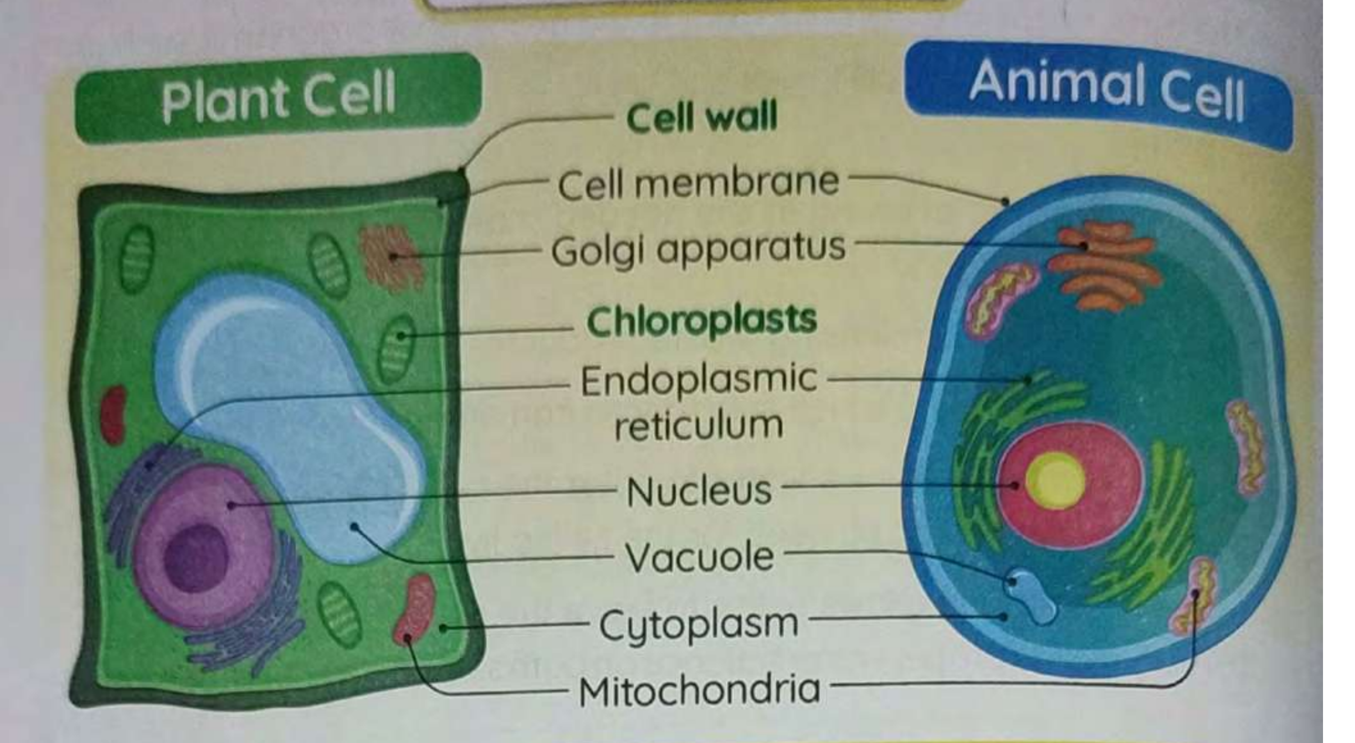


Brain Cells



Muscle Cells

Structure of the Cell



Comparison Between Plant and Animal Cells

P.O.C	Animal Cells	Plant Cells
Differences	They don't have a **cell wall** or **chloroplast**	They have a **cell wall** and a **chloroplast**
Similarities	Both of them have common organelles, such as: 1 Cell membrane 2 Cytoplasm 3 Nucleus 4 Mitochondria 5 Endoplasmic reticulum 6 Golgi apparatus 7 Vacuole	

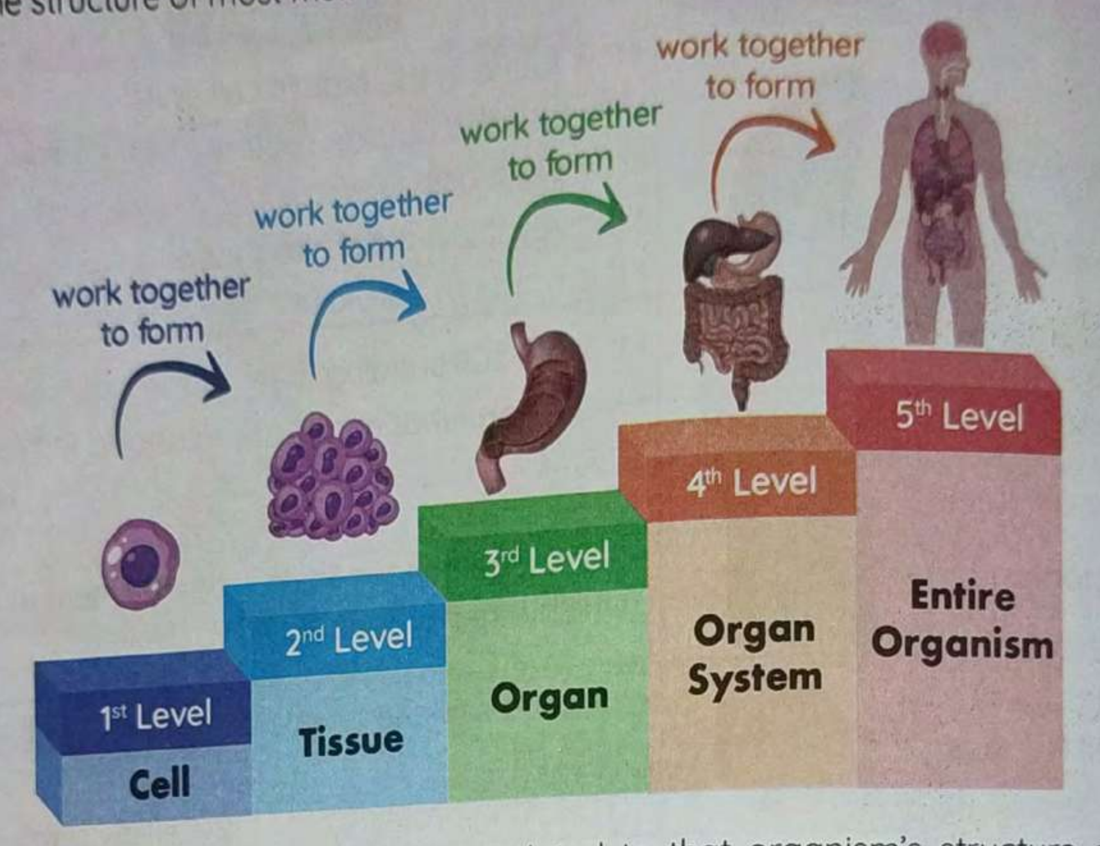
- Both plant and animal cells have common organelles to **control**, **organize** and **maintain** the cell.
- Plants can make their own food because they have **chloroplasts**.
- Animals can't make their own food because they don't have chloroplasts.
- Animals do not take on the rigid structures that plants do because they don't have cell walls.
- Animals have other ways of keeping their shape.
  - Some animals have **bones**.
  - Insects have an **exoskeleton** (a hard, shell-like covering).

The Function of Each Organelle Inside the Cell

Organelle	Illustration	Function
Cell Wall		• It is found in the plant's cell only. • It's the rigid outside material that surrounds the plant cells. • It gives them a **definite** shape. • It is made of **cellulose**.
Plasma (Cell) Membrane		• It is the surrounding layer of the cell. • It controls what materials enter and leave the cell.
Cytoplasm		• It is the **gelatinous liquid** inside the cells in which other **organelles** float.
Cell Nucleus		• It controls all the functions inside the cell, such as: 1 Making proteins 2 Cell division
Mitochondria		• They convert **sugar** into **energy** for the cell. • They are the **powerhouses** of the cell. • **Cellular respiration** takes place in it.
Vacuole		• They are **saclike** structures used for the storage of nutrients, water, and waste. • In plant cells, large vacuoles contain water.
Chloroplast		• It is found in the plant's cell only. • It contains chlorophyll and carries out the **photosynthesis process**.
Endoplasmic Reticulum		• It helps in **assembling** and **transporting** proteins.
Golgi Apparatus		1 It helps in **preparing, packaging** and **transporting** materials within the cell. 2 It helps in **transporting** materials out the cell.

Levels of Biological Organization

» The structure of most multicellular organisms is organized into **five levels**:



» Each level plays a specific role related to that organism's structure and function.

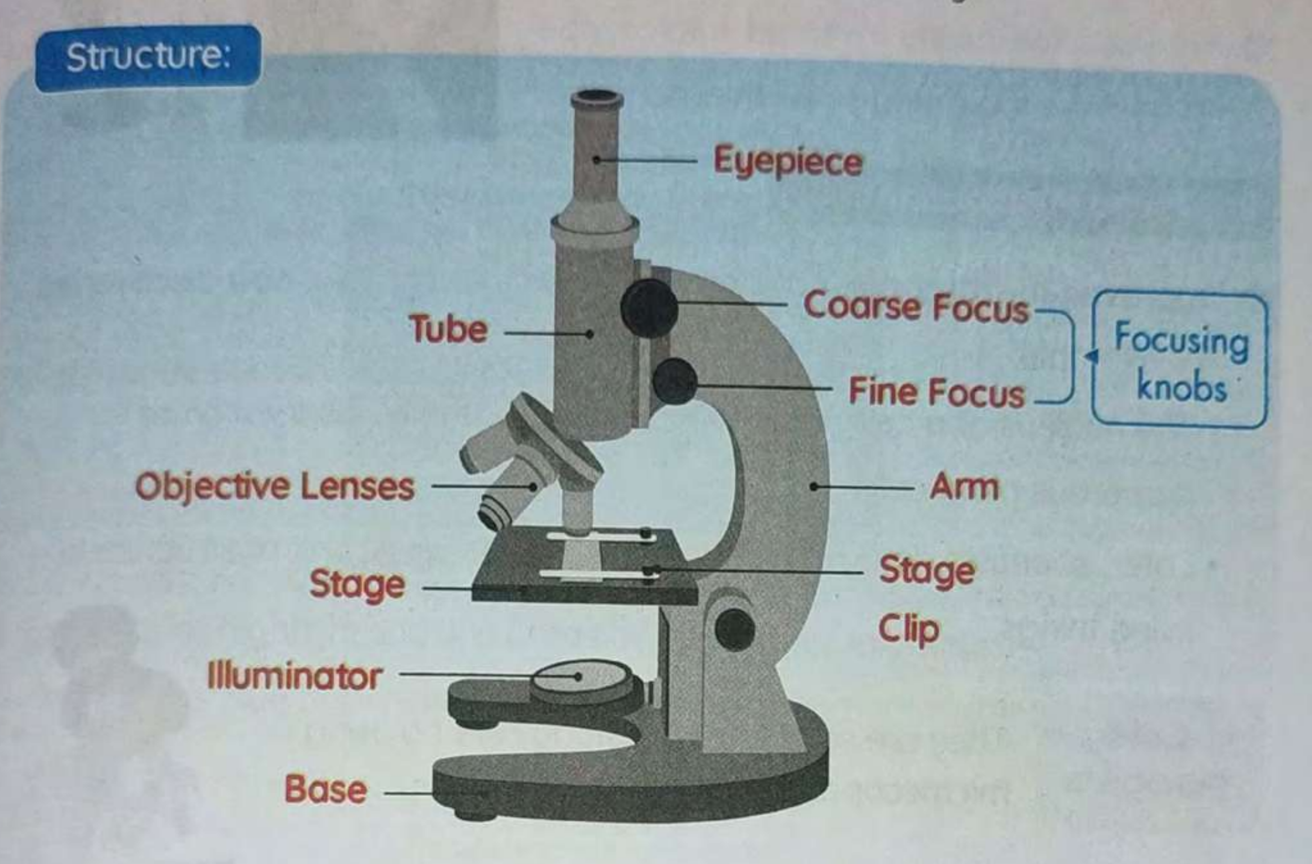
Level	Definition	Examples
Cell	The basic (smallest) unit of life.	Stomach cells
Tissue	A group of similar cells that share a common origin and perform the same function.	Stomach tissues
Organ	A group of tissues involved in performing a specific function.	Stomach
System	A group of organs that perform a specific function.	Digestive system
Entire Organism	A group of systems that work together.	Human

Compound Microscope

Importance:

» It magnifies cells that can't be seen by the unaided eye.

Structure:



Steps of using the microscope:






1. Place the microscope slide on the stage and secure it with the stage clips.
2. Pick up the lowest-power objective lens.
3. Look at the slide through the eyepiece while adjusting the focusing knobs to get more clear view of the specimen.
4. Clean up the slide and store the microscope safely when you are finished.

History of The Microscope:

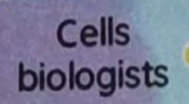




- Robert Hooke was the first person to use the word "**cell**".
- He used the newly invented microscope to observe too many small things.

Improved Microscope:

- **Improved microscopes** have allowed scientists to make **new discoveries,** for example:
  - The nucleus of a cell was discovered through the observation of numerous plant cells.
  - Later, scientists determined that cells are the basic unit of structure in living things.



Cells biologists	They are scientists who study **cells** by using **microscopes** in **laboratories**.

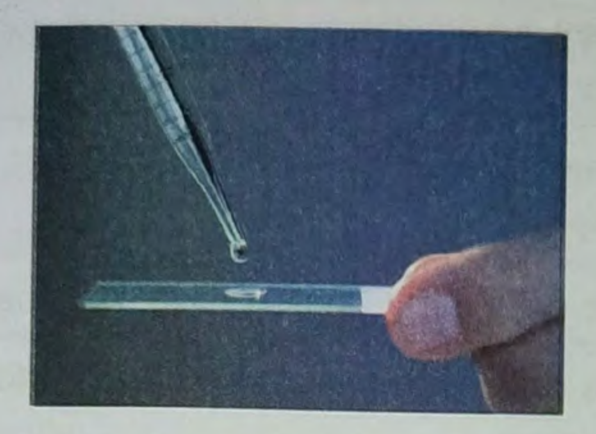
The roles of cell biologists:

1. They study how cells function in living organisms.
2. They conduct experiments and investigate how cells respond to different variables.
3. They analyze data and present their findings to other researchers.
4. **Some cell biologists can work with doctors.** G.R
   To watch how cells can work to repair body parts or how cells respond to medications.
5. **Some cell biologists work in agriculture.** G.R
   To study how plant cells respond to different environmental factors.

Staining Cells

» Stains (dyes) are used to make the cell's structures more visible under a microscope. G.R

- Because cells are usually clear and colorless and it is hard to see their structures, even under a microscope.



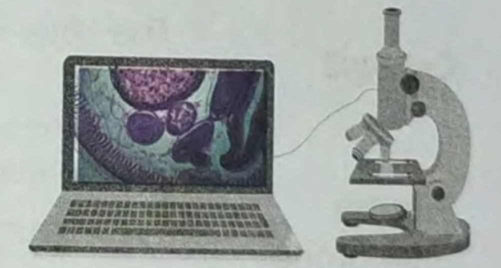
» Some stains highlight specific areas of the cell, **for example:**

- **Methylene blue dye** makes one part of the cells more visible.

Cells in 3D

» Scientists have built a microscope that shows a live cell in 3D.

» This means that scientists can see the top, sides, and layers of a cell.



The importance of seeing cells in 3D:

1. This helps biologists learn more about cell parts and how cells divide.
2. This helps doctors who treat cancer offer more help to patients.

How does the 3D microscope work?

1. These new 3D microscopes take pictures of the cell in layers.
2. A computer puts the layers together.
3. The colors are then added to the image.

2 Definitions of Concept 1

Cell	It is the basic unit (building block) of a living organism's body.
Multicellular organisms	They are organisms whose bodies are composed of more than one cell.
Unicellular organisms	They are organisms whose bodies are composed of only one cell.
Organelle	It is a part inside the cell that has a specific function.
Tissue	It is a group of identical cells that perform the same function.
Organ	It is a group of tissues that work together to perform a specific function.
System	It is a group of organs that perform a specific function.
Cell wall	The outer layer of the plant cell that supports and keeps its shape.
Plasma membrane	• The outer lining of the cell that surrounds the cytoplasm. • The structure that controls the substances that enter or leave the cell.
Selective permeability	A feature through which the cell membrane determines which substances will pass through.
Cytoplasm	• A gelatenious liquid inside the cell.
Nucleus	The control center of the cell that is responsible for all the cell's activities.
Mitochondria	They are the powerhouses of the cell that release energy from food during cellular respiration.

Cellular respiration	A vital process through which the cell uses oxygen gas to get energy from food.
Vacuoles	They are saclike structures that store nutrients, water, and waste inside the cell.
Chloroplasts	Organelles are found in the plant cell that produce sugar from sunlight in the photosynthesis process.
Chlorophyll pigment	A green pigment found in chloroplasts that absorbs sunlight needed for the photosynthesis process.
Endoplasmic reticulum	An organelle that is responsible for the assembly and transport of proteins in the cell.
Golgi apparatus	An organelle that packages and transports materials inside the cell and outside it.
Cell biologist	The scientist who studies cell function.
Methylene blue	A stain (dye) is used to see a specific part of the cell under the microscope.
3D microscope	A type of microscope that allows scientists to see the top, sides, and layers of the cell. (3 dimensions of the cell)

3 Give Reasons for... Concept 1

1. The cell provides the structure of the living organism's body.
   - Because cells are the building blocks of all living organisms' bodies.
2. A plant is considered a multicellular organism.
   - Because its body is composed of more than one cell.
3. Bacteria are considered unicellular organisms.
   - Because its body consists of only one cell.
4. You can see a bird's unfertilized egg, but you can't see your skin cells withou a microscope.
   - Because the unfertilized egg is a very large cell, but the skin cell is very smal
5. The cell membrane is very important for the cell.
   - Because it allows the substances to pass in and out of the cell according t its needs.
6. The cells of the same living organisms are different in shape and size.
   - Because they have different functions.
7. The cell membrane has an important role in the cell.
   - Because it controls the substances that pass in or out of the cell.
8. The cell membrane has a selective permeability property.
   - To allow the needed substances to enter the cell and the waste materia to leave it.
9. The nucleus is the control center of the cell.
   - Because it directs all the activities of the cell, such as cell division an producing protein.
10. The plant cell has a definite shape.
    - Because it is surrounded by a cell wall from the outside.
11. Mitochondria have an important role in the cell.
    - Because they power the cell with energy.

12 Animals can't make their own food.
- Because animal cells don't have chloroplasts.

13 Animals can keep their shapes.
- Because they have bones or exoskeletons, such as in insects.

14 The vacuole of the plant cell is larger than that of the animal cell.
- Because it stores a large amount of water.

15 Mitochondria are considered the powerhouse of the cell.
- Because they power the cell with energy.

16 The Golgi apparatus acts as the post office of a city.
- Because it packages and transports all materials inside the cell and outside it.

17 The chloroplasts are the food factories of the cell.
- Because they make sugar from sunlight through the photosynthesis process.

18 The endoplasmic reticulum has an important role in the cell.
- Because it assembles and transports proteins in the cell.

19 It is hard to see the cell structures even under a microscope without dye.
- Because the cell is colorless and clear.

20 Cell biologists have a great role in the fields of medicine and agriculture.
- They help doctors figure out the response of a cell to the medicine, and they study the effect of environmental factors on the plant.

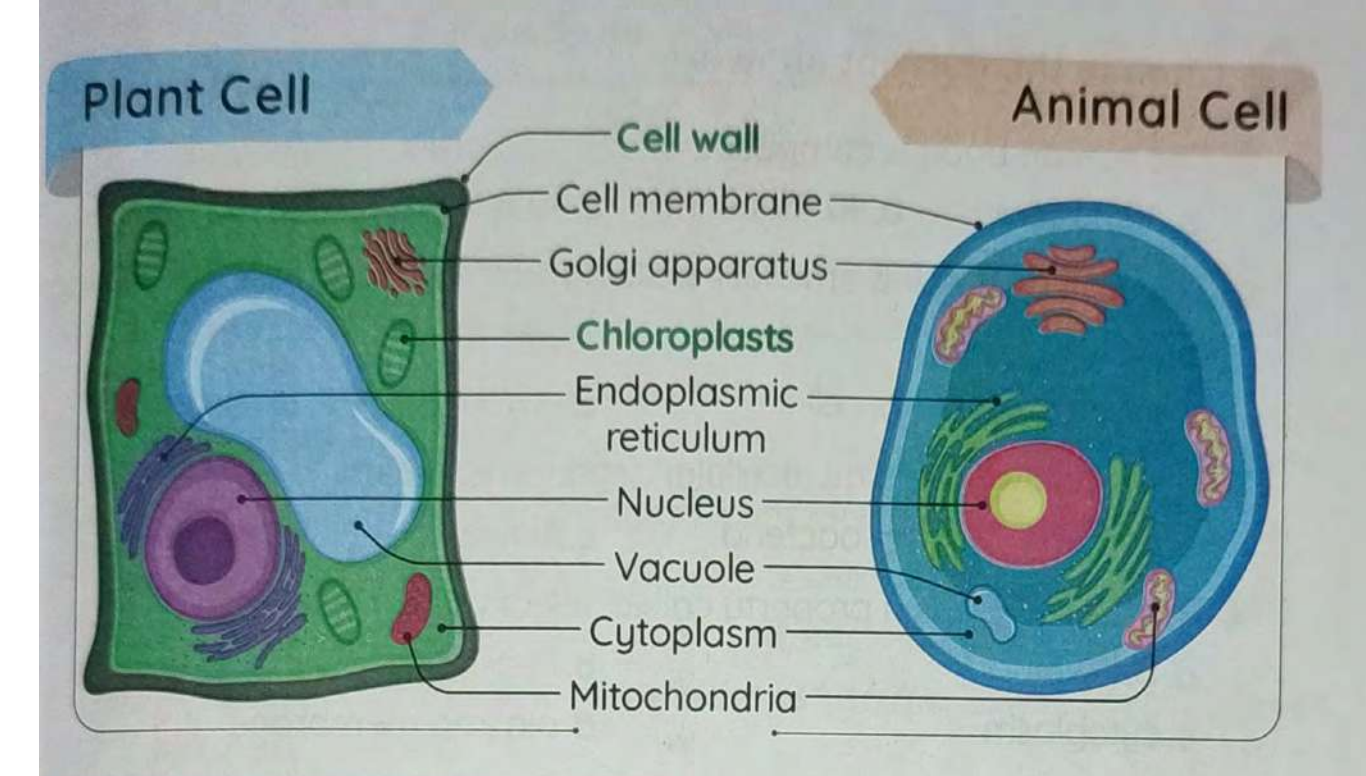
21 Cell biologists help doctors treat cancer.
- Because they study the cell parts and how the cell divides.

4 What Happens If...? Concept 1

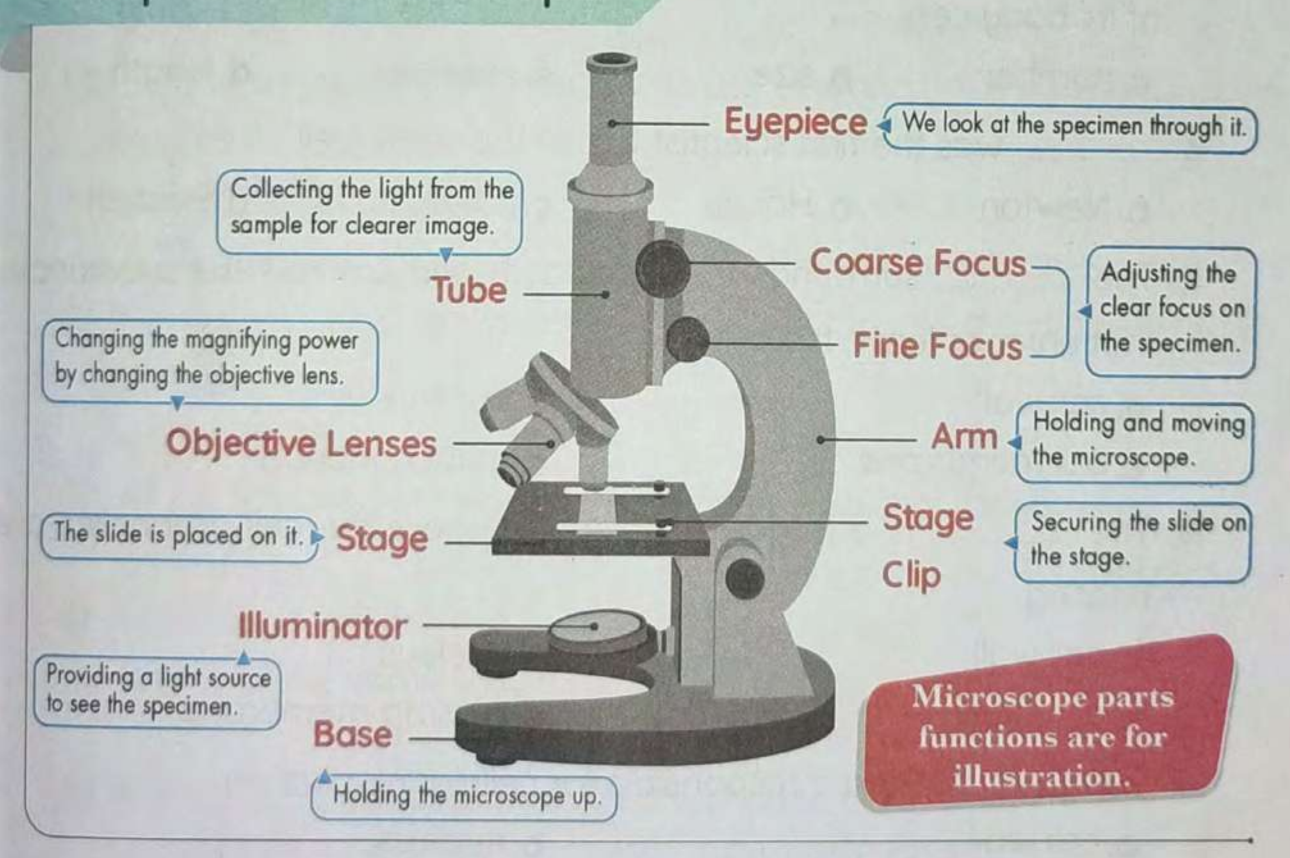
1. The cell can't meet its basic needs?
   - It can't do the functions that keep organisms alive.
2. The cell membrane in an animal cell is absent?
   - The cell can't get the needed substances and can't get rid of waste ones.
3. Too much water enters the cell?
   - The cell will swell and burst.
4. The cell wall in the plant cell is absent?
   - It will have an indefinite shape.
5. Mitochondria in an animal cell are absent?
   - The cell can't get energy to do all its functions.
6. The cell couldn't carry out the cellular respiration?
   - The cell can't get energy to perform its activities.
7. Chloroplasts in a plant cell are damaged or functioning improperly?
   - The plant can't make its own food.
8. The endoplasmic reticulum is absent from the cell?
   - The cell can't assemble or transport protein.
9. The Golgi apparatus is absent from the cell?
   - Materials can't be packaged or transported inside or outside the cell.
10. The plant has a small vacuole?
    - It can't store a large amount of water to perform its functions.
11. You look at a specimen of a cheek dyed with methylene blue under a microscope?
    - I can see the nucleus.

5 Important Drawings Concept 1

Plant Cell / Animal Cell



Compound Microscope



6 Revision on Concept 1

1 Choose the correct answer:

1. The human body is composed of .... cells.
   a. 40 hundred b. 40 thousand c. 40 million d. 40 trillion
2. The .... is the smallest building unit and structure of a living organism's body.
   a. tissue b. cell c. organ d. system
3. All the following are multicellular organisms, except ....
   a. humans b. bacteria c. plants d. animals
4. The .... has a property called selective permeability.
   a. cell wall b. nucleus
   c. cytoplasm d. plasma membrane
5. A living organism grows and reproduces by increasing the .... of its body cells.
   a. number b. size c. volume d. length
6. .... was the first scientist to use the word "cell".
   b. Newton b. Hooke c. Edison d. Einstein
7. The .... surrounds the cytoplasm and controls the substance that enter or leave the cell.
   a. cell wall b. nucleus
   c. cell membrane d. mitochondrion
8. The .... is a jelly-like substance where the cell organelles are floating.
   a. cell wall b. nucleus
   c. cytoplasm d. plasma membrane
9. The .... is/ are responsible for cellular respiration.
   a. cell wall b. nucleus
   c. plasma membrane d. mitochondria

10 Which of the following organelles is located in the plant cell only?

a. Chloroplasts
b. Cell wall
c. Nucleus
d. a and b

11 The .... surrounds the plant cell from outside and gives it a definite shape.

a. nucleus
b. cell wall
c. cytoplasm
d. cell membrane

12 All the following can be stored in the cell vacuole, except ....

a. wastes
b. blood
c. water
d. nutrients

13 .... are unique structures that exist only in the plant cell.

a. Mitochondria
b. Nuclei
c. Vacuoles
d. Chloroplasts

14 The .... release(s) energy from food to power the cell.

a. mitochondria
b. cell wall
c. nucleus
d. cell membrane

15 If the cell wall is the gate of the plant cell, so the .... is considered its battery.

a. mitochondria
b. cell wall
c. nucleus
d. cell membrane

16 .... packages and transports proteins and other materials within the cell.

a. Golgi apparatus
b. The nucleus
c. The cell wall
d. The cell membrane

17 If the diameter of an animal cell is 10 microns, so the diameter of its nucleus may be ....

a. 10 microns
b. 2 microns
c. 10 mm
d. 2 cm

18 All the following are from the cell features, except it is usually ....

a. very small
b. colorless
c. clear
d. colorful

19 A plant and fish are common in having ....

a. cells of the same shape
b. cells of the same size
c. cells
d. no cells

20 The .... transports proteins within the cell.

a. golgi apparatus
b. mitochondria
c. cell wall
d. nucleus

2 Put (✓) or (✗):

1. You can see a bird's unfertilized egg without a microscope. ( )
2. A cell releases oxygen and food and intakes in waste materials. ( )
3. A bacterial cell is between 0.1 and 0.005 mm long. ( )
4. The cell will burst when too much water keeps entering it. ( )
5. All the bodies of living organisms have more than one cell. ( )
6. The nucleus is discovered during observation of some animal cells. ( )
7. A leaf cell and a red blood cell can exist in the same organism. ( )
8. Both the heart and stomach are considered tissues. ( )
9. The nucleus and cell membrane float in the cytoplasm. ( )
10. All cells have a cell membrane. ( )
11. Mitochondria are the part that is responsible for the cellular respiration ( )
12. The endoplasmic reticulum is the post office that packages proteins in the cell. ( )
13. Chloroplasts have a blue pigment called methylene blue. ( )
14. The plant cell has a larger vacuole than that of the animal cell. ( )
15. The 2D microscopes take pictures of the cell in layers. ( )
16. Cancer is caused by the slow division of a cell. ( )

3 Write the scientific term:

1. They are the building blocks of life on Earth.
2. They are living organisms, and their bodies consist of more than one cell.
3. A device can be used to magnify cells, so we can see them.
4. A type of water added to the samples in microscopes.
5. It is a group of tissues that perform a specific function
6. It is a group of organs that perform a specific function.
7. The structure that controls cell division and other cell activities.
8. A liquid found in the cell that holds its organelles.
9. They are the powerhouses of energy in the cell.

10. The process through which the cell uses oxygen gas to get chemical energy from the food.
11. They are saclike organelles that store nutrients, water, and wastes.
12. Organelles in the plant cell carry out the photosynthesis process.
13. The scientist who studies cell function.
14. The stain is used to see a specific part of the cell under the microscope.
15. A disease caused by the abnormal division of a cell too quickly.

4 Complete the following sentences using the words between the brackets:

A

(Bones - Chloroplasts - pigment chlorophyll - exoskeleton - mitochondria - cell membrane - cell wall)

1. .... release energy from the food, but .... produce food from sunlight.
2. .... support the fish body shape, while a/an .... supports that of insects.
3. In photosynthesis process, ... found in chloroplasts absorb(s) sunlight.
4. The outermost layer of the plant cell is the .... while it is .... in the animal cell.

B

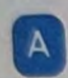
(Golgi apparatus - sugar - 3D microscope - Nucleus - energy - endoplasmic reticulum)

1. .... transport(s) proteins produced by .... through the cell.
2. Mitochondria convert .... into .... that is needed for the cell activities.
3. .... is used to see all layers of the cell.
4. .... is considered the brain of the cell that controls all its activities.

5 Cross out the odd word:

1. Cell membrane - Cell wall - Nucleus - Cytoplasm
2. Blood cell - Stomach - Lung - Liver
3. Plants - Humans - Bacteria - Animals

6 Choose from column (A) what suits it in column (B):



Column (A)	Column (B)
1 Mitochondria	a. is the packaging factory of the cell.
2 Golgi apparatus	b. is the food factory of the cell.
3 Chloroplast	c. resembles the construction worker of a city.
4 Vacuole	d. are the powerhouses of the cell.
5 Endoplasmic reticulum	e. Is considered the storage facility of the cell.

1 .... 2 .... 3 .... 4 .... 5 ....

Column (A)	Column (B)
1 Nucleus	a. are responsible for the cellular respiration.
2 Cell membrane	b. controls all cell activities.
3 Cell wall	c. supports the plant cell from outside.
4 Mitochondria	d. controls the passing of substances into or out the cell.

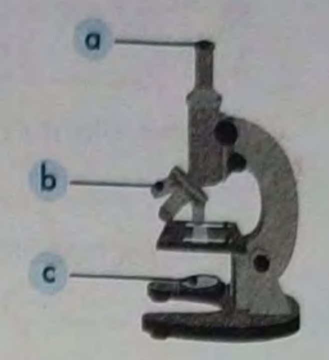
1 .... 2 .... 3 .... 4 ....



7 Study the following figures:

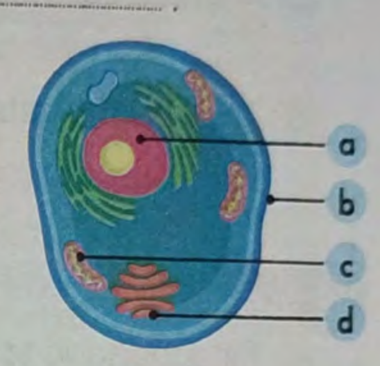
A

1. The opposite figure represents ....
2. Write the following labels:
   a. ....
   b. ....
   c. ....



B

1. The opposite figure represents ....
2. Write the following labels:
   a. ....
   b. ....
   c. ....
   d. ....



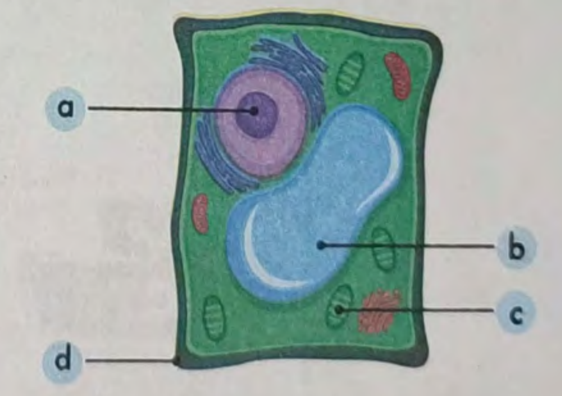
3. Mention the functions of the parts a and c.

....

....

C

1. The opposite figure represents ....
2. Write the following labels:
   a. ....
   b. ....
   c. ....
   d. ....



3. Mention the function of part c.

....

....

8 Give reasons for:

1. The nucleus is the control center of the cell.

....

2. The liver is considered as an organ.

....

3. The plant cell has a definite shape, but the animal cell doesn't.

....

4. Mitochondria have an important role in the cell.

....

5. Animals can't make their own food.

....

6. The chloroplasts are the food factories of the cell.

....

9 What happens if:

1. Mitochondria stopped converting sugar into energy?

....

2. The Golgi apparatus is absent from the cell?

....

3. Too much water enters the cell?

....

Concept 2 The Body as a System

1 Summary of Concept 2

The Body as a System

- Different systems in the body work to do different jobs.
- Each individual body system works with the other body systems.

The Interaction Between Systems

The nervous system depends on other body systems functions:

For example, nerve cells need nutrients

The Digestive System	The Circulatory System	The Nervous System
The **nutrients** enter the body as food that is broken down by **the digestive system**.	The nutrients are transported to nerve cells by **the circulatory system**.	The nerve cells use nutrients to perform their function.

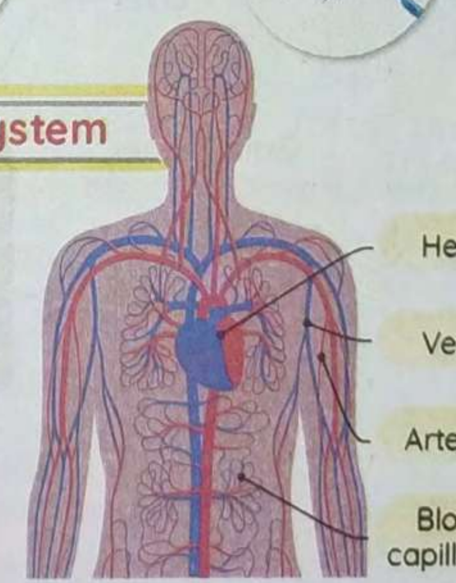






Circulatory System

- **The circulatory system** transports **blood**, **gases**, **hormones**, and **nutrients** throughout the body.
- **The heart muscle** pumps the blood throughout the body.
- **Blood vessels** allow blood to flow through the body.



Respiratory System

Lungs	• Lungs **take in oxygen gas** and **remove carbon dioxide gas** as part of respiration and circulation processes.
Diaphragm	• The diaphragm is a muscle that helps with respiration, as follow, • When diaphragm muscle **contracts**, the lungs take in air. • When the diaphragm muscle **relaxes**, air is pushed out of the lungs
Bloodstream	• It transports oxygen from lungs to all your body parts.

Nose

Trachea

Lungs

Diaphragm

Digestive System

» It breaks down **food** into **nutrients,** which the body can use for energy an growth.

The Structure of the Digestive System

Mouth

Esophagus

Liver

Stomach

Gallbladder

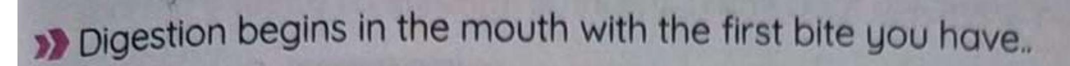
Pancreas

Small intestine

Large intestine

Rectum

Anus



1 The Beginning of Digestion



» Digestion begins in the mouth with the first bite you have..

Jaw muscles	• They create movement to help your teeth chew food. • Chewing breaks up the food and increases its surface area.
Saliva	• It softens the food by adding **(enzymes)** that get mixed with it to start the chemical breakdown.

» Then the muscles of the esophagus push the food down to the stomach.



2 Breaking Down Food

(a) In the stomach:



- The continuous churning and the secreting of the stomach's **digestive fluids (acid and enzymes)** further break down the food.

(b) In the small intestine:



- **The pancreas** and **gallbladder** secrete additional enzymes that assist in the chemical breakdown of food.
- Absorption of nutrients takes place in the **small intestine**.



- **Nutrients** are carried away to the blood through the blood capillaries in the wall of the small intestine.

3 Transporting Nutrients

» Nutrients are transported to different organs via the **circulatory system**.

1. Some nutrients are **used immediately**.
2. The rest of the nutrients are **stored**.

• **For example,**

a. Some nutrients are stored as fat.

b. The liver and muscles can store **sugar glucose**.

- They convert it into a special storage substance as an animal starch called **glycogen**.
- The liver and muscles can then release the glucose when it is needed.

4 Getting Rid of Waste

Undigested (unabsorbed) food enters the large intestine as a **soupy mixture**.

1 Large intestine

- It reabsorbs most of the water, changing a liquid into a solid wastes called feces (stool).



2 Rectum

- It is the last section of the large intestine.
- **Function:** It stores feces until they are expelled.

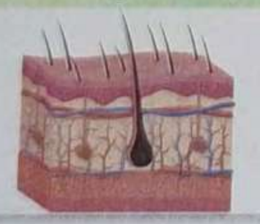
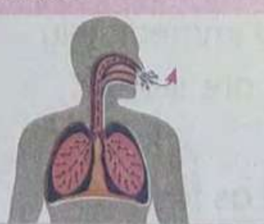
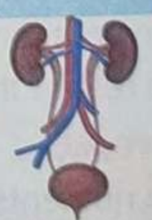
3 Anus

- It is a muscular opening at the end of the rectum.
- **Function:** Waste materials are eliminated from the body through it.

Excretory System

It collects waste materials produced by cells, then removes them from the body.

The systems that involved in excretion are

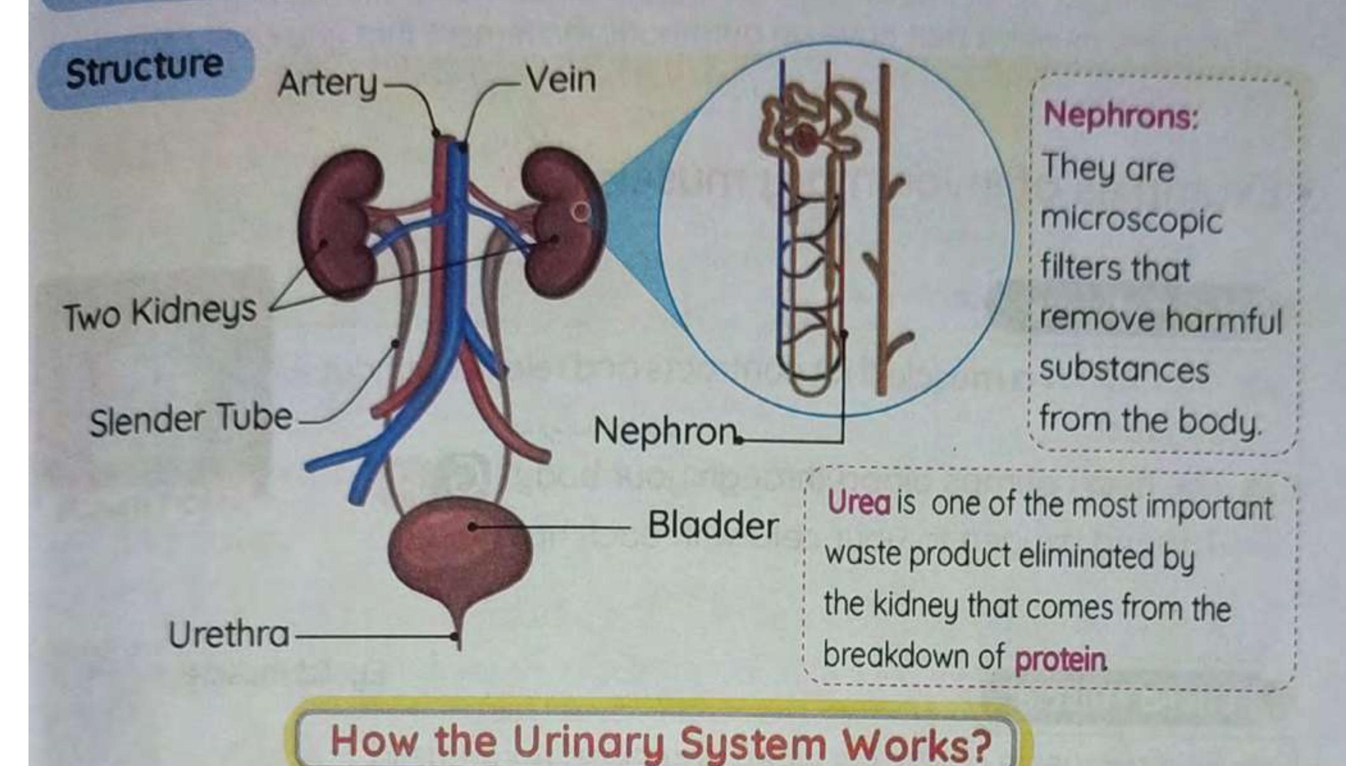
Skin	Respiratory System	Urinary System
When you sweat, waste leaves the body through the pores in your skin.	When you exhale, carbon dioxide leaves your body as waste.	The urinary system removes waste products from your blood.
		

Excretion It is the process of eliminating waste from the human body.

Urinary System

Importance
- It removes harmful wastes from your blood.

Structure



Nephrons: They are microscopic filters that remove harmful substances from the body.

Urea is one of the most important waste product eliminated by the kidney that comes from the breakdown of **protein**.

How the Urinary System Works?

1. Large artery brings blood into each kidney.
2. **Inside the kidney,**
   - Tiny blood vessels branch off and pass through part of each **nephron**.
   - Nephrons filter the blood and remove harmful substances.
3. After filtering is complete, **urea**, **other waste products**, and **water** become **urine**.
4. Urine leaves each kidney through a slender tube and collects in the bladder.
5. The bladder empties through another tube called the urethra.

Urination • It is the process of expelling urine from the body.

» Muscles must **contract** and **relax** to allow for movement.

1 Involuntary Muscles

They are muscles that have an automatic movement that you can't control.

• Examples of involuntary muscles:

1 Heart Muscle:


Heart muscle

» The heart is **a muscle** that contracts and relaxes without any rest.

» The heart pumps blood through your body. G.R
To send oxygen to your cells with each heartbeat.

2 Eyelid Muscle:

Eyelid muscle

» Eyelid muscle contracts when you close your eyelid.

» You blink about 10 times a minute without even thinking about it.

2 Voluntary Muscles

They are the skeletal muscles that you can control their movement.

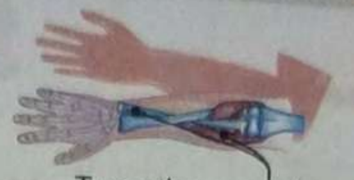
1 Arm Muscles:

» Bending your elbow takes the action of two different voluntary muscles.

When you bend your arm	When you straighten your arm
 	Front muscle (relax) Back muscle (contract)

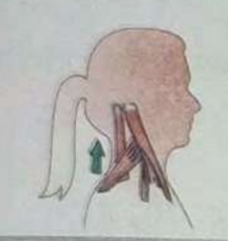
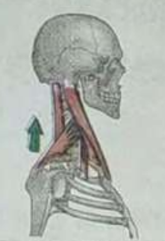
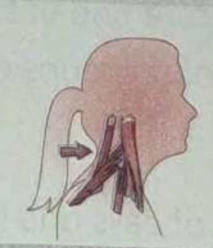
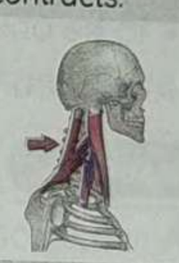
2 Forearm Muscles:

» When you turn your hand over, it takes the action of two important voluntary muscles in your forearm.

When you palm facing up,	When you palm facing down,
One of your forearm muscles contracts. 	 Two other muscles contract.

3 Neck Muscles:

» Two important neck muscles work when you move your head up and down.

When you lift your head up, one of your neck muscles contracts.	When you pull your head down, the other muscle contracts.
 	 

4 Abdomen Muscles:



» On each side of your body, you have two important abdominal muscles (abdominals).

» **When you twist your body to one side,**
- The two muscles on that side **contract** together.
- The two muscles on the other side **relax** together.

Involuntary muscles: Stomach muscles, Eyelid muscle, Heart muscle, Esophagus muscles, Intestine muscles



Building Living Systems

Muscle cell → bundled together to form → Muscle tissue → bundled together to form → Muscle (an organ)

1 Cells:

- Cells have a variety of **shapes** and **sizes** to perform specific functions fo[r] example.
- Muscle cells need to be shaped like long fibers. G.R
  - To allow the movement.
  - To be able to store and use energy quickly.
- All around the body, groups of similar cells work together to form tissue[s]

2 Tissues:

- A tissue consists of cells and is considered a part of an organ.

3 Organs:

- **Musculoskeletal system:** It is the system that consists of **bones**, **muscles**, **ligaments**, **tendons**, and **cartilages**.

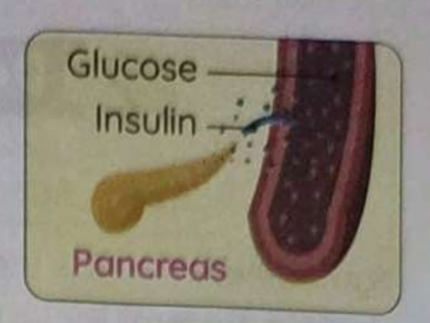
During the fight-or-flight response:

Many body systems work together to help the body react to danger.

1 Endocrine system	• It releases hormones to initiate the fight-or-flight reaction.
2 Circulatory system	• The heart pumps blood quickly around the body. • Heart rate and blood pressure increase.
3 Respiratory system	• It begins working harder to send more oxygenated blood to th[e] muscles and brain to increase **stamina** and **reflexes**.

Pancreas:

It's an organ that produces the right amount of insulin to regulate the amount of sugar in your blood.



Hormone Insulin:

It's a hormone that moves sugar from the blood into the cells.

People with diabetes:

- Diabetes is one of the most well-known **disorders** of the endocrine system.

The pancreas is not working correctly. **So** Their bodies cannot make insulin or cannot use it. **So** Sugar stays in the blood and causes many problems.

Treatment of diabetes:

Many people with diabetes must give themselves regular shots of insulin.

Insulin pump



Insulin pump: It's a device that is attached to the body to regulate blood sugar levels with automatic insulin injections.

Technology and diabetes:

Researchers are now working to develop an **artificial pancreas** as an internal organ instead of an external pump, so that it could deliver insulin as needed.

2 Definitions on Concept 2

Sympathetic nervous system	It is the system that stimulates the adrenal glands to make body organs respond to a stressful situation.
Muscle	A bundle of long fibers that is able to contract to allow body movement.
Skeletal muscles	Muscles attached to bones that cause the bones to move.
Musculoskeletal system	It is a system that consists of bones, muscles, tendons, ligaments, and cartilage.
Involuntary muscles	They are the muscles that have an automatic movement that you can't control.
Voluntary muscles.	They are skeletal muscles that you can control their movement.
Endocrine System	A system that contains glands that release hormones to help the human body prepare to react.
Glands	They are organs that secrete hormones inside the blood.
Circulatory system	It is the system that is responsible for the transportation of gases, nutrients, and hormones through the body.
Respiratory system	It is the system that responsible for taking in oxygen and getting rid of carbon dioxide gas through the respiration process.
Lungs	They are the most important organs of the respiratory system because they take in oxygen gas and expel carbon dioxide.
Diaphragm	A large muscle that helps in the respiration process.

Digestion process	The process of breaking down food into molecules that the body can use for energy and growth.
Digestive system	The system that breaks down food into nutrients that the body uses to get energy.
Saliva	It is a liquid enzyme produced in the mouth that softens and breaks down food.
Enzymes	They are chemicals stimulated by the endocrine system to help in food digestion.
Esophagus	It is a muscular tube that pushes food down to the stomach.
Colon	It is a part of the large intestine that receives undigested food from the small intestine.
Feces (stool)	They are solid wastes formed after absorbing water from undigested food in the large intestine.
Rectum	It is the last section of the large intestine where the stool is stored.
Anus	It is a muscular opening at the end of the rectum.
The excretory system	The systems that eliminate the wastes from the body.
Excretion	It is the process of eliminating wastes from the human body.
Urinary system	It is the system that filters blood from dissolved waste materials in the form of urine.
Kidneys	They are the most important organs of the urinary system because they filter blood from wastes.
Nephrons	They are microscopic filters inside the kidneys to filter the blood from wastes.
Urination	It is the process of expelling urine outside the body.
Urine	It is a waste product produced from kidneys and it contains urea, water and other wastes.

Urea	It is a waste product that comes from the breakdown of proteins, and it is eliminated by the kidneys.
Bladder	It stores urine till it is eliminated from the body.
Pancreas	An organ that produces the right amount of insulin hormone to regulate the amount of sugar in your blood.
Insulin	A hormone produced by the pancreas that regulates the amount of sugar in the blood.
Diabetes	A disease resulted from the disorder of the body to make or use insulin.
Insulin pump	A device that is attached to the body to regulate blood sugar levels.

A Functions of some body systems:

System	Function
Sympathetic nervous system	• It stimulates the adrenal glands to make body organs respond to a stressful situation.
Musculoskeletal system	• It is responsible for the movement of the body through the contraction of muscles.
Endocrine system	• It activates the glands to produce hormones to face a stressful situation.
Nervous system	• The nervous system directly controls various organs of the body.
Digestive system	• It breaks down food into simpler nutrients to supply the body with energy.
Circulatory system	• It delivers gases, nutrients, hormones and wastes throug the body.

Respiratory system	• It takes in oxygen from the air. • It expels carbon dioxide outside the body.
Excretory system	• It helps the body get rid of waste materials.
Urinary system	• It eliminates waste materials from the blood in the form of urine.

B Functions of some body organs:

Organ	Function
Glands	They produce hormones to let body organs face a danger situation.
Skeletal muscles	They allow the body to move.
Brain	It receives information from all body organs and sends response signals to them.
Lungs	They take in oxygen and get rid of carbon dioxide.
Diaphragm	• It contracts to let oxygen gas in the lungs. • It relaxes to expel carbon dioxide out of the body.
Heart	It's a muscle that contracts to pump blood to all the body parts.
Blood vessels	They allow blood to flow through the body.
Mouth	• The digestion process starts in it. • Chewing food into small pieces with the teeth and jaw's muscles.
Esophagus	It is a muscle that pushes food down to the stomach.

Final Revision

Stomach	It is a muscular organ that is responsible for breaking down food with the help of digestive enzymes.
Small intestine	• It completes food digestion with the help of gallbladder and pancreatic enzymes. • It is responsible for the absorption of nutrients.
Pancreas	• It produces digestive enzymes in the small intestine to break down food. • It produces insulin, which regulates the glucose level in the blood.
Gallbladder	It produces digestive enzymes in the small intestine to break down food.
Large intestine	They absorb water from undigested food to convert it int solid wastes (stool).
Rectum	It stores faces until they are expelled outside the body.
Anus	Stool is eliminated throughout the body.
Skin	It eliminates waste materials in the form of sweat througl its pores.
Kidney	It filters the blood from wastes materials through nephror
Bladder	It stores urine till it is expeled outside the body through the urethra tube.
Liver	It stores glucose in the form of glycogen.

3 Give Reasons for... Concept 2

1. All body systems work together in harmony.
   - To keep the human body functioning well and alive.
2. The digestive system is important for the body's muscles and nerve cells.
   - As it provides them with nutrients to get energy.
3. The skeletal system can't do its job without muscles.
   - To move our bones, the muscles must contract and relax.
4. Your heart pumps more blood to your muscles when you run.
   - To deliver the nutrients and oxygen that are needed for muscle to run.
5. The digestive and circulatory systems depend on the nervous system to function.
   - Because the nervous system controls the muscles of the heart and stomach.
6. The cells of a multicellular organism are different in shape and size.
   - Because they have different functions.
7. Muscle cells need to be shaped like long fibers.
   - To allow movement and store and use energy quickly.
8. We can move our different body parts.
   - Due to contractions and relaxations of skeletal muscles that cause bones to move.
9. The heart is an involuntary muscle.
   - Because it contracts and relaxes without rest.
10. Arm muscles are voluntary muscles.
    - Because we can control their movements.
11. There are muscles around the eyeballs.
    - To help you move your eyes in different directions.
12. The endocrine system plays an important role in a dangerous situation.
    - Because it stimulates glands to release hormones to help the human body prepare to react to the danger.

13 When facing a danger, your blood pressure increases.
- Because the heart pushes more blood to the muscles, heart, and other vit organs to face the danger.

14 Various body systems work together under pressure.
- To help the body react to the danger.

15 The food must be broken down inside the human body.
- To convert it into nutrients that the body can use for getting energy and grow

16 In the case of fight, or flight muscles convert glycogen into glucose.
- To power the body's cells with energy.

17 Saliva has an important role in food digestion.
- Because it softens the food, it adds an enzyme to break down the food.

18 The excretory system keeps the body healthy.
- It collects and removes waste materials produced by cells.

19 The digestive system isn't involved in the excretion.
- Because excretion means waste materials must leave the body through a membra

20 Nephrons are considered microscopic filters.
- Because they filter the blood and remove harmful substances from it.

21 Blood cells and proteins can't pass through nephrons.
- Because blood cells and proteins are too large to pass through t nephrons.

22 Kidneys play a very important role in the urinary system.
- Because they constantly clean and filter your blood, up to 300 times a d

23 The pancreas must produce the right amount of insulin.
- To regulate the amount of sugar in the blood.

24 Researchers are now working to develop an artificial pancreas.
- To help people with diabetes, as it could deliver insulin as needed.

25 Salt can pass through the nephron's membrane.
- Because the salt particles are too small.

26 Kidneys are considered a filtration system for blood.
- Because it removes waste products from the blood.

27 Some people may get diabetes.
- Because their bodies can't make or use insulin properly.

4 What Happens If...? Concept 2

1. Your body muscles don't get nutrients?
   - The muscles won't be able to contract or move.
2. Your arm muscles contract?
   - The arm will move.
3. You lift your fist towards your shoulder?
   - The front muscle of the upper arm contracts and the back one relaxes.
4. You close your eyelid?
   - Eyelid muscle contracts.
5. There are no muscles around your eyeball?
   - You cannot move your eyes in different directions.
6. You twist your body to one side?
   - The two muscles on that side contract together and the two muscles on the other side relax together.
7. The diaphragm muscle contracts?
   - The lungs take in oxygen from air.
8. The digestive system doesn't turn the food into nutrients?
   - The body cannot get energy.
9. The human body is exposed to a danger situation. (concerning the stored glycogen)?
   - The glycogen will be converted into glucose.
10. Your body did not remove wastes?
    - You would become sick.
11. The blood enters the nephrons?
    - Nephrons filter the blood and remove harmful substances from the body.
12. The pancreas is not working properly in the human body?
    - The person may suffer from diabetes.
13. People with diabetes not obtain regular shots of insulin?
    - Sugar level increases in the blood.

5 Revision on Concept 2

1 Choose the correct answer:

1. The muscles of .... are involuntary muscles.
   a. neck b. heart c. abdomen d. forearm
2. Liver and muscles can store .... in the form of ....
   a. fats - glucose b. glucose - glycogen
   c. glycogen- glucose d. glycogen - fat
3. All the following are involved in excretion process, except the ....
   a. urinary system b. skin
   c. digestive system d. respiratory system
4. Urine leaves the kidneys and passes to the ....
   a. urethra b. nephron c. blood d. bladder
5. .... and .... can't pass through nephron's membrane.
   a. Salt - red blood cells b. Protein - salt
   c. Salt - water d. Protein - red blood cells
6. Insulin is produced by the ....
   a. liver b. stomach c. gallbladder d. pancreas
7. Nutrients are carried to the blood via blood capillaries in the wall ....
   a. large intestine b. small intestine c. stomach d. mouth
8. The .... system controls the body temperature and blood pressur
   a. digestive b. respiratory c. urinary d. endocrine
9. The circulatory system carries all the following materials through t body, except ....
   a. hormones b. gases c. glands d. nutrients
10. .... purify the blood from harmful waste.
    a. Lungs b. Kidneys c. Bladders d. Arteries

11 When you are stressed out, your .... increase(s).
a. heartrate only
b. blood pressure only
c. bones' size
d. heartrate and blood pressure

12 .... system provides nutrients for the skeletal system to grow and repair itself.
a. Nervous
b. Digestive
c. Urinary
d. Reproductive

13 A diabetic person's body can't make or use ....
a. salt
b. insulin
c. protein
d. muscles

14 When you twist your body, the .... muscles move.
a. abdominal
b. intestine
c. heart
d. eyelid

15 .... are microscopic filters found in each kidney.
a. Glands
b. Bladders
c. Nephrons
d. Blood vessels

16 The heartbeats in the .... system accelerates when feeling afraid.
a. urinary
b. nervous
c. circulatory
d. digestive

17 Sweat is excreted by the ....
a. skin
b. lungs
c. heart
d. kidneys

18 Urine leaves the kidney through .... to collected in ....
a. urethra, bladder
b. slender tube, bladder
c. artery, bladder
d. bladder, urethra

19 Solid wastes leave the body through ....
a. Gallbladder
b. anus
c. pancreas
d. mouth

2 Put (✓) or (✗):

1 Involuntary muscles can move spontaneously without even thinking of it. ( )

2 Insulin pumps help people who suffer from kidney failure. ( )

3 A human can control the movement of blood in his body. ( )

4 The cells of a multicellular organism have different shapes and sizes. ( )

5 The tissue consists of a group of organs. ( )

6 The nephron is the functional unit of the kidneys. ( )

7 The excretory system uses blood to carry oxygen from the lungs t
the body. (

8 Saliva is a hormone that breaks down food chemically in the mouth. (

9 Undigested food enters the large intestine as a soupy mixture. (

10 The liver and muscles can't release the glucose when they need it. (

11 Water is absorbed from undigested food in the small intestine. (

12 The skin takes part in expelling sweat through the pores. (

13 In the kidney's model, paper filter stimulates the membrane inside
nephron. (

14 When the heart beats faster, the blood pressure decreases. (

15 Urination is the process of expelling blood outside the body. (

16 The body can store nutrients as fat and glucose. (

3 Write the scientific term:

1 Muscles that move your bones.

2 A group of organs that work together to perform a specific functio

3 The process of removing wastes from the blood by the two kidney

4 An enzyme that moistens food in the mouth.

5 The system that collects and gets rid of waste materials in the human boc

6 A bundle of long fibers that can contract to allow body movement.

7 An organ that sends a signal to muscles to begin responding to any threat.

8 Muscles that move automatically without thinking of it.

9 The organ of the digestive system where the nutrients are absorbe

10 The system that is responsible for eliminating carbon dioxide from th
body.

11 The last section of the large intestine is where stool is stored.

12 A blood vessel through which the blood enters each kidney.

13 The muscles that move the teeth to chew food.

14 The system that consists of bones, muscles, cartilages, tendons, an
ligaments.

4 Complete the following sentences using the words between the brackets:

A

(sugar - water - cells - stamina - blood - brain)

1. Insulin moves sugar through .... to .... to get energy.
2. .... is absorbed from the undigested food in the large intestine.
3. A diabetic person must carefully monitor the level of .... in their blood.
4. Respiratory system sends more oxygenated blood to the muscles and .... to increase .... and reflexes.

B

(tendons - diaphragm - hormones - endocrine system - bones)

1. Skeletomuscular system consists of muscles, ... and ....
2. During a fight-or-flight response, ... are released by the ....
3. When the .... muscle contract, the lung take in air.

C

(nutrients - artery - blood - adrenal glands - sympathetic nervous - force - kidney)

1. Nerve cells need .... to do their work, while muscles exert a .... when they contract.
2. During acute stress, ... system stimulates .... to produce hormones.
3. .... enters each .... through a large artery to be filtered.

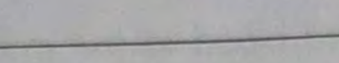
5 Cross out the odd word:

1. Heart - Artery - Blood capillaries - Kidney
2. Stomach - Heart - Esophagus - Mouth
3. Skin - Kidney - Bladder - Urethra

6 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Glycogen	a. is a solid waste that is stored in rectum.
2 Stool	b. is stored in bladder.
3 Urea	c. is a type of an animal starch.
4 Urine	d. is produced from breaking down proteins in body cells.



1 .... 2 .... 3 .... 4 ....

B

Column (A)	Column (B)
1 Circulatory system	a. allow body movement.
2 Musculoskeletal	b. releases hormones into the body.
3 Endocrine system	c. breaks food into molecules that the body absorbs.
4 Digestive system	d. transports gases, hormones and nutrients through the body.

1 .... 2 .... 3 .... 4 ....



7 Give reasons for:

1. Your heart pumps more blood to your muscles when you run.

   ....

2. Muscle cells need to be shaped like long fibers.

   ....

3. The heart is an involuntary muscle.

   ....

4. When facing danger, your blood pressure increases.

....

5. Nephrons are considered as microscopic filters.

....

8 What happens if:

1. You watch a scary movie?

....

2. People with diabetes don't obtain regular shots of insulin?

....

3. The person's kidney is damaged?

....

4. The diaphragm muscle relaxes?

....

5. Skin doesn't have any pores?

....

9 In the following figures:

1. The opposite figure represents ....
2. Write the following labels:
   - a ....
   - b ....
   - c ....
   - d ....
   - e ....
   - f ....
3. **Choose:**

   The parts (a – f – d) produce both digestive enzymes and a hormone.

Unit 1 – concept 1 – questions

Lesson 1

Choose the correct answer:

1) The ……………… is the building unit of a living organism's body.
   a. brick b. cell c. organ d. blood

2) Humans are ……………….. organisms.
   a. unicellular c. multicellular
   b. prokaryote d. simple

3) An unaided human eye can see an object ………… millimeters long.
   a. 0.01 b. 0.005 c. 0.5 d. 0.001

4) An unaided human eye can't see all the following, except …………………..
   a. an onion's cell c. a bacterial cell
   b. a skin's cell d. a bird's unfertilized egg cell

5) A living organism grows and reproduces by increasing the ……………. of its body cells.
   a. number b. size c. volume d. length

6) All the following are multicellular living organisms, except ……………..
   a. a bean plant b. a cat c. bacteria d. a human

7) All the following are from the basic needs for the cell, except …………….
   a. Water b. oxygen c. food d. carbon dioxide

8) The ……………… regulates the substances that pass in or out of the cell.
   a. Nucleus — c. cell wall
   b. plasma membrane — d. cytoplasm

9) Which statement about the cells is false?
   a. All living organisms are composed of cells.
   b. All cells come from existing cells.
   c. Most cells are microscopic in size.
   d. All cells have a nucleus.

<u>Put (√) or (X):</u>

1- Most cells are usually very small. ( )

2- The unaided human eye can see a bacteria cell. ( )

3- Different living organisms have similar cells that have similar functions. ( )

4- Increasing the number of the living organism's cells occurs during reproduction process only. ( )

5- The cell membrane allows water to enter the cell, but not to leave it. ( )

6- There must be a water imbalance at the two sides of the cell membrane, so that the cell won't burst. ( )

7- The cell membrane allows only the needed substances to enter the cell. ( )

8- Scientists can use a telescope to see the very small cells. ( )

9- An unfertilized bird egg contains more than one egg cell.

( )

10- Multicellular organisms consist of only one single cell, such as the plant cell. ( )

Write the scientific term:

1. They are the building units of life on Earth. (………………..)
2. They are living organisms, and their bodies consist of more than one cell. (…………………………………………………..)
3. They are living organisms, and their bodies consist of only one cell. (…………………………………………………..)
4. It's a device used to see very small cells as a plant cell. (………………………………..)
5. It controls the substances that enter or leave the cell. (…………………………………)
6. It's a gas which the cell needs to get energy and perform its vital activities. (…………………………………..)
7. They're materials released from the cell. (…………………………)
8. It's a liquid material that is necessary for the cell to do its function well. (……………………………)

Complete the following sentences using the words between the brackets:

(**nucleus - shape – oxygen - energy - cell membrane – size – waste products – food**)

1) Cells in our body are different in …………………….. and …………………….. because they have different functions.
2) All cells are composed of a …………………….. .
3) A cell takes in ………………… and ………………. to get ………………….. but it releases
4) Not all cells contain …………………..

Correct the underlined words:

1- Most cells are very **large**, so we can see them with our naked eyes. (……………………..)
2- A cell is a **simple** structure that carries out its vital activities. (………………………..)
3- Bacteria are **multicellular** living organisms. (…………………………….)
4- Living organisms can be divided into multicellular and unicellular organisms according to the **size** of cells in their bodies. (……………………)
5- The cell will **shrink** when too much water keeps entering it. (…………………….)

Cross out the odd word:

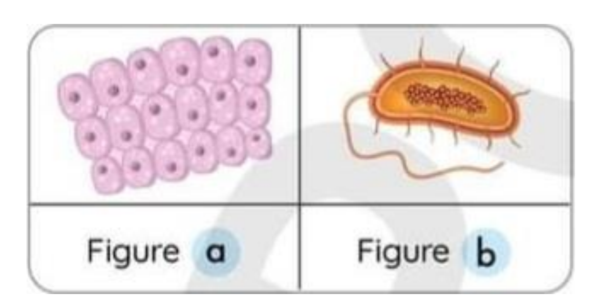
a) Plant - Bacteria - Animal - Human
b) A skin cell - A plant cell - An animal's cell - A bird's unfertilized egg cell
c) Oxygen Water - Carbon dioxide - Food

Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1. A cell membrane 2. A bird's unfertilized egg cell 3. Bacterium 4. A skin cell	a. is smaller than 0.005 mm long. b. length ranges between 0.005 to 0.1 mm. c. controls the amount of water that enters the cell. d. is a very large cell.

Study the following figures, then complete the sentences below:

1) Figure ……… represents a bacterial cell, as it consists of …………………… cell(s).
2) Figure ……… represents the cells of a human skin.



Give reasons for:

1. The cell provides the structure of the living organism's body.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

2. A plant is considered a multicellular organism.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

3. Bacteria are considered unicellular organisms.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

4. You can see a bird's unfertilized egg, but you can't see your skin cell without a microscope.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

5. The cell membrane is very important for the cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

6. The cells of the same living organisms are different in shape and size.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

7. The amount of water must be balanced at the two sides of the cell membrane.

………………………………………………………………………………………………

………………………………………………………………………………………………

What happens if:

1- The cell can't get its basic needs.

………………………………………………………………………………………………

………………………………………………………………………………………………

2- The cell membrane is absent in an animal cell.

………………………………………………………………………………………………

………………………………………………………………………………………………

3- Too much water enters the cell.

………………………………………………………………………………………………

………………………………………………………………………………………………

Lesson 2

Choose the correct answer:

1) …………………… was the first scientist to use the word "cell".
   a. Newton b. Hooke c. Edison d. Einstein

2) The nucleus was discovered during an observation of an enormous ……………….. cell.
   a. animal b. bacterial c. human d. plant

3) Scientists concluded that the ………………. is the basic unit of the organism's structure.
   a. cell   b. organ   c. tissue   d. system

4) All the following are form the parts of a compound microscope, except the ……………….
   a. eyepiece   c. illuminator
   b. objective lenses   d. objective mirrors

5) The membrane of an onion consists of similar units called …………………
   a. cells   b. nuclei   c. organs   d. tissues

6) You can change the power of magnifying of a microscope by using another ………………….
   a. objective lens   b. eyepiece   c. mirror   d. arm

<u>Put (√) or (X):</u>

1. Developed microscopes have allowed scientists to make new discoveries. (   )
2. Sometimes a single cell exists on its own as in bacteria. (   )
3. The membrane of an onion consists of different units called cells. (   )
4. The cell in an onion membrane contains many components. (   )
5. A leaf cell and a red blood cell can exist in the same organism. (   )
6. Scientists must be open to new ideas about how cells work. (   )

Write the scientific term:

1- It's a device that can be used to magnify cells.

(………………………………………)

2- They're the identical building units of living organisms.

(…………………………..)

3- It's the type of water added on the samples in microscopes.

(………………………………………………..)

4- It's a part of the microscope through which you look at the sample. (………………………………………..)

5- It's a part of the microscope that changes the magnifying power. (………………………………………….)

Correct the underlined words:

I. A complex living system contains **one cell**.

(……………………………………..)

II. We use drops of **tap** water on the sample in a microscope. (……………………………)

III. We look at the sample through the **objective lens** of the microscope. (…………………………………)

IV. We change the magnifying power of the microscope by using a different **mirror**. (……………………………..)

Cross out the odd word:

- Objective lens - Stage clips - Eyepiece - Distilled water
- A leaf cell - A red blood cell - A skin cell - A bird's unfertilized egg cell

Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1) The cell	a) changes the magnifying power of the microscope.
2) A compound microscope	b) is the building unit of the living organism's structure.
3) Changing the objective lens	c) can be used to examine a thin membrane of an onion.

Answer the following questions:

Study the following three figures that represent the samples under a compound microscope, then put true or false:

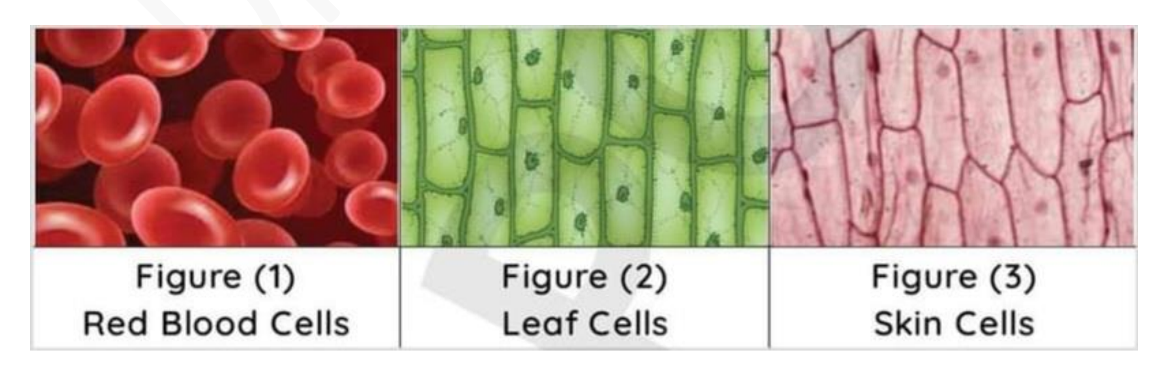


Figure (1) Red Blood Cells | Figure (2) Leaf Cells | Figure (3) Skin Cells

1. All the three samples represent microscopic cells. ( )
2. The three samples have different functions. ( )

3. All the three samples can exist in the same organism. ( )
4. Each figure represents the basic units that form an organism. ( )

The following diagram represents the ....

Write the following labels:

a) ....

b) ....

c) ....

d) ....

e) ....

Give a reason for:

The microscope is very important for the biologists and botanists.

....

....

What happens if:

The microscope wasn't invented.

....

....

Lesson 3

Choose the correct answer:

1) The human body is composed of ………………cells.
   a. 40 hundred b. 40 thousand c. 40 million d. 40 trillion

2) All the following are from the cells found in the animal body, except the ………………….
   a. blood cells c. bone cells
   b. xylem cells d. muscle cells

3) A/An ………………… is a unicellular simple living organism.
   a. human b. animal c. bacterium d. plant

4) The tissue is a set of similar …………………….
   a. systems b. cells c. organs d. organelles

5) All the following are considered organs, except the ………………..
   a. lung b. heart c. stomach d. muscle tissue

6) The systems that keep a multicellular organism alive are divided into ……………… levels.
   a. two b. three c. four d. five

7) All the following organelles are common in plants and animals cells, except the …………………
   a. cytoplasm c. nucleus
   b. cell wall d. cell membrane

8) Cell's components are suspended in the …………………..
   a. Nucleus c. cytoplasm
   b. cell wall d. cell membrane

9) The ………………. surrounds the plant cell from outside and gives it a definite shape.
   a. Nucleus c. cytoplasm
   b. cell wall d. cell membrane

10) The …………….. is a liquid that fills the cavity of the cell and is surrounded by the cell membrane.
   a. Nucleus c. cytoplasm
   b. cell wall d. mitochondrion

11) The ……………. surrounds the cytoplasm and controls the substances that enter or leave the cell.
   a. cell wall c. plasma membrane
   b. nucleus d. mitochondrion

<u>Put (√) or (x):</u>

1- The number of cells in plants and animals varies from a species to another. ( )
2- A stomach consists of a group of tissues. ( )
3- The liver is a tissue, while the heart is an organ. ( )
4- The respiratory system consists of a set of cells. ( )
5- The cell is the smallest building unit of a living organism. ( )
6- Both the mitochondrion and plasma membrane are found in plant and animal cells. ( )

7- The cell membrane surrounds the plant cell from outside. ( )

8- Nucleus, mitochondria and cell membrane float in the cytoplasm. (   )

9- The outermost layer of the cell is called "cell membrane". (   )

Write the scientific term:

1. It is a structure inside the cell that has a specific function. (……………………………….)
2. It is a set of tissues forming a structural unit to perform a specific function. (………………………………………)
3. It is a group of identical cells that perform the same function. (…………………………………)
4. It is a group of organs that perform a specific function. (…………………………………)
5. It's a liquid in which the cell's organelles float. (……………………………….)
6. It's a feature through which the cell membrane determines which substances will pass through. (…………………………………………………………..)
7. It's the outer lining of the cell that surrounds the cytoplasm. (………………………………………)
8. It's the structure that controls the cell activities. (……………………………………)
9. They are the powerhouses of energy in the cell.

(……………………………………..)

10. It's a process of using oxygen to get chemical energy from food in the cell. (…………………………………….)

Complete the following sentences using the words between the brackets:

(cells - similar - nucleus - organelles – tissues)

1) A cell consists of ……………………….. that are functioning in ……………………………… ways to maintain the cell.
2) An organ is composed of a set of ……………………….. that are composed of a group of …………………………….
3) The ……………………….. in the cell is responsible for cell division.

Correct the underlined words:

A) A system is composed of a set of **tissues** that work together.

(……………………..)

B) The stomach and lung are considered **systems**.

(……………………..)

C) The liver consists of a group of **organelles**.

(……………………..)

D) The **cytoplasm** is the control center of the cell.

(…………………………….)

E) The **cell wall** is a semi-permeable membrane that controls the substances entering the cell.

(………………………………………)

F) **Photosynthesis process** takes place inside the mitochondria.

(……………………………………)

G) The **plant** cell is the building unit of the human body.

(……………………)

Cross out the odd word:

- Cell membrane - Cell wall - Nucleus – Cytoplasm
- Digestive system - Respiratory system - Circulatory system - Heart
- Blood cell - Stomach - Lung - Liver

Choose from column (A) what suits it in column (B):

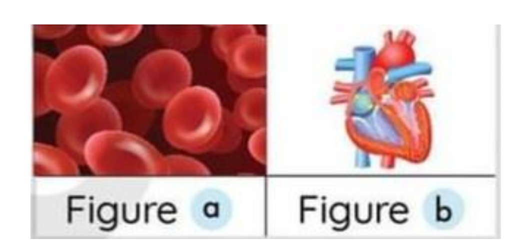
Column (A)	Column (B)
1- Nucleus	a- is the control center of the cell.
2- Cell membrane	b- supports the plant cell from outside.
3- Cell wall	c- controls the substances passing into or out of the cell.

Answer the following questions:

Study the following three figures, then answer:

A) Figure (   ) consists of tissues.

B) Figure (   ) represents a group of cells.



The following diagram represents the ……………………………

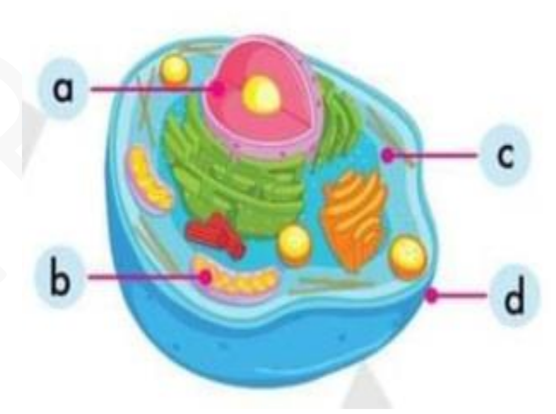
Write the following labels:

a) ………………………………………….

b) ………………………………………….

c) ………………………………………….

d) ………………………………………….



Give reasons for:

❖ All organs of the digestive system work together.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

❖ The cell membrane has the selective permeability property.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

❖ The nucleus has an important role for the cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

❖ The mitochondrion has an important role for the cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

<u>What happens if:</u>

1) The cell wall in the plant cell is absent.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

2) The mitochondria are absent from an animal cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Lesson 4

Choose the correct answer:

1. Which of the following is found in both plant and animal cells?
   a. Cell membrane   c. Large, water-filled vacuole
   b. Cell wall   d. Chloroplast

2. Which two organelles are involved in transportation?
   a. Nucleus and endoplasmic reticulum
   b. Mitochondria and nucleus
   c. Chloroplast and Golgi apparatus
   d. Endoplasmic reticulum and Golgi apparatus

3. Photosynthesis process takes place in the ………………… while cellular respiration takes place in the ………………..
   a. nucleus – cytoplasm   c. mitochondria – chloroplast
   b. mitochondria – nucleus   d. chloroplast - mitochondria

4. …………………… are unique structures that exist only in the plant cell.
   a. Mitochondria   b. Nuclei   c. Vacuoles   d. Chloroplasts

5. The plant cell is distinguished from the animal cell by the presence of ………………… and ……………………
   a. chloroplasts - nucleus   c. chloroplasts - cell wall
   b. nucleus - cell wall   d. nucleus - cytoplasm

6. The ………………… release(s) energy to power the cell.
   a. Mitochondria   c. nucleus
   b. cell wall   d. cell membrane

7. ………………… is the command center of the cell.
   a. Chloroplast   c. Nucleus
   b. Mitochondrion   d. Cell membrane

8. All the following can be stored in the cell vacuole, except …………………………..
   a. waste   b. cytoplasm   c. water   d. nutrients

9. The ………………. transports proteins in the cell.
   a. golgi apparatus   c. endoplasmic reticulum
   b. Mitochondrion   d. nucleus

10. The ………………… controls the substances that enter or leave the cell.
   a. cytoplasm   b. cell wall   c. nucleus   d. cell membrane

11. The envelopes of the cell used for transporting materials are the ……………….
   a. nuclei   c. mitochondria
   b. chloroplasts   d. Golgi bodies

12. The …………….. in the cell resembles the powerful brick wall of a city.
   a. Nucleus   b. cell wall   c. cytoplasm   d. cell membrane

13. Golgi apparatus can ………………… inside the cell.
   a. transport protein   c. makes proteins
   b. package waste   d. a and b

Put (√) or (x):

1- Both plant and animal cells have common organelles to organize and maintain the cell. ( )

2- Chloroplasts release energy from the food, but mitochondria produce energy from the sunlight. ( )

3- Chloroplasts have yellow grains called chlorophyll pigment. ( )

4- The outermost layer of a plant cell is the cell wall, but the outermost layer in an animal cell is the cell membrane. ( )

5- The animal cell has a definite shape, while the plant cell has an indefinite shape. ( )

6- Golgi apparatus can transport materials inside cells, but it can't transport them outside them. ( )

7- The plant cell has a larger vacuole than that of the animal cell. ( )

8- The cell membrane looks like guards at the gates of a city. ( )

Write the scientific term:

1) They help plant and animal cells control, organize, and maintain the cell. (………………………………)

2) It controls the functions inside the cell and cell division. (…………………………………)

3) They are saclike organelles that store nutrients, water, and waste. (…………………………………)

4) It's the fluid found in the cell that holds its organelles. (……………………………………..)

5) They're organelles in the plant cell that convert light energy into sugar. (……………………………………..)

6) They're organelles in the plant cell that power the cell with energy. (……………………………………..)

7) It's a process that occurs inside the chloroplast. (…………………………………)

8) It's a process that occurs inside the mitochondria. (…………………………………)

Complete the following sentences using the words between the brackets:

(Golgi apparatus - sugar - Mitochondria – chloroplasts – exoskeleton - chlorophyll - Bones - endoplasmic reticulum)

- ……………………. support(s) the fish body shape, while a/an ………………………. supports that of insects.
- In the photosynthesis process, ………………………. absorb(s) sunlight, where …………………………. use(s) it to make the plant's food.
- ……………………. transport(s) proteins produced by the ……………………………. through the cell.

- ………………………… convert(s) ……………………… into energy that is needed for the cell activities.

Correct the underlined words:

- Chloroplasts have a green color due to the presence of **iodine** pigment. (……………………………)
- A plant cell has a rigid shape due to the presence of the **cell membrane**. (…………………………)
- Insects have a hard, shell-like support called **an endoskeleton**. (……………………………)
- Cytoplasm is a **solid** matter that surrounds the cell's organelles. (……………………)
- The endoplasmic reticulum helps in the assembly and transport of **fats** in the cell. (………………………)
- **The endoplasmic reticulum** is the post office that packages proteins in the cell. (………………………………)

Cross out the odd word:

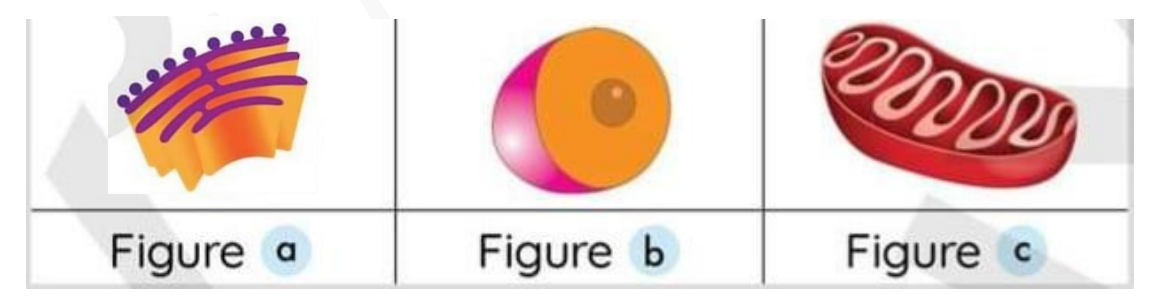
- Nucleus - Endoplasmic reticulum - Mitochondria - Chloroplasts
- Horses - Plants - Dogs – Insects

Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1. Mitochondrion	a) is the packaging factory for the cell.
2. Golgi apparatus	b) is the food factory of the cell.
3. Chloroplast	c) resembles the construction worker of a city.
4. Vacuole	d) is the powerhouse of the cell.
5. Endoplasmic reticulum	e) is considered the storage facility of the cell.
6. Nucleus	f) resembles the city hall that controls all the cell activities.

Answer the following questions:

Study the following three figures, then answer:



- Figure (   ) converts sugar into energy.
- Figure (   ) is considered the protein maker in the cell.
- Figure (   ) helps in assembling and transporting proteins.

The following diagrams represent the

……………………. and …………………………..

Write the following labels:

a) ………………………………….

b) ………………………………….

c) ………………………………….

d) ………………………………….

e) ………………………………….

Mention the function of parts b and d.

…………………………………………………………………………………………

…………………………………………………………………………………………..

<u>Give reasons for:</u>

- Both plant and animal cells have common organelles.

…………………………………………………………………………………………….

…………………………………………………………………………………………….

- Animals can't make their own food.

…………………………………………………………………………………………….

…………………………………………………………………………………………

- Nucleus is the command center of the cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The animal cell has an indefinite shape, but the plant cell has a definite shape.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- Animals can keep their shapes.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The vacuole of the plant cell is larger than that of the animal cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- Mitochondria are considered the powerhouse of the cell.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The Golgi apparatus resembles the post office of a city.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The chloroplasts are the food factories of the cell.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Endoplasmic reticulum has an important role in the cell.

………………………………………………………………………………………………

………………………………………………………………………………………………

<u>What happens if:</u>

1- Chloroplasts in a plant cell are damaged or functioning improperly.

………………………………………………………………………………………………

………………………………………………………………………………………………

2- Mitochondria stopped converting sugar into energy.

………………………………………………………………………………………………

………………………………………………………………………………………………

3- The endoplasmic reticulum is absent from the cell.

………………………………………………………………………………………………

………………………………………………………………………………………………

4- The Golgi apparatus is absent from the cell.

………………………………………………………………………………………………

………………………………………………………………………………………………

5- The plant has a small vacuole.

……………………………………………………………………………………………….

……………………………………………………………………………………………….

Lesson 5 & 6

Choose the correct answer:

1. Cell biologists use microscopes to magnify ………………… to appear larger.
   a. stones b. bricks c. cells d. rocks

2. Cell biologists do experiments and analyze data to study all the following, except …………………..
   a. how cells respond to different medicines.
   b. how rocks are formed on Earth's surface.
   c. how cells can work to repair body parts.
   d. how plant cells respond to different environmental factors.

3. To see the structure of a cell under microscope we must color it by using …………………
   a. stains b. water c. sunlight d. vinegar

4. Methylene blue dye helps us to see the …………………… of the cell as a blue area under microscope.
   a. cytoplasm c. chloroplast
   b. Golgi apparatus d. nucleus

5. The 3D microscope can help in all the following, except that it helps ……..
    a. cell biologists learning more about cell components.
    b. scientists to know how planets revolve around the sun.
    c. doctors to treat some diseases as cancer.
    d. cell biologists learning more about how cells divide.

<u>Put (√) or (x):</u>

1) Cells are very large, as the diameter of an animal cell is about 0.001 cm. ( )
2) Cell biologists are scientists who study rocks. ( )
3) Cell biologists work in laboratories and do experiments to study how cells work inside living organisms. ( )
4) Cells are usually clear and colorless, so it is easy to see their structures under microscope. ( )
5) The 3D microscope can help doctors to treat cancer disease. ( )

<u>Write the scientific term of each of the following:</u>

1- They are scientists who study cells. (……………………………………)
2- A stain that is used to color the nucleus of the cell in blue color. (……………………………………)
3- The microscope that helps us to see the top, sides and layers of the cell. (……………………………………)

Complete the following sentences using the words below:

(methylene blue - microscope – agriculture - cell biologists - doctors)

A) Cell biologists use ……………………….. to magnify cells of bacteria.

B) Cell biologists work in ……………………………. to study plant cells and their respond different environmental factors.

C) Cell biologists work with …………………………… to watch how cells can work to repair the human body parts.

D) To see the nucleus of a cell under microscope, we can stain the cell with ……………………………….

E) The 3D microscope can help …………………………… learn more about how cells divide.

Give reasons for:

- Some cell biologists work with doctors.

………………………………………………………………………………………….

………………………………………………………………………………………….

- We must stain cells before examining them under microscope.

………………………………………………………………………………………….

………………………………………………………………………………………….

What happens if…

We stain a sample of cheek cells with methylene blue dye.

……………………………………………………………………………………………….

……………………………………………………………………………………………….

Look at the opposite picture, then complete the following sentences:

1. These cells are seem large, because they are magnified by using …………………….
2. The structure of the cell which appears clearly with blue color in the opposite picture is the …………………
3. These cells are stained by ………………………….. dye.

Cheek cells

Look at the opposite picture, then answer the following questions: ***(A) Put (√) or (x):***

1. This device helps doctors to treat some diseases such as cancer. (   )
2. This device doesn't need a computer to do its functions. (   )
3. This device helps cell biologists to see the cells in 3D. (   )



3D microscope

(B) Rearrange the following sentences in the right order to show how this device works:

- A computer puts these layers together. ( )
- Colors are added to the formed image. ( )
- It takes pictures of a cell in layers. ( )

Unit 1 – concept 1 – answers

Lesson 1

Choose the correct answer:

1) The ……………… is the building unit of a living organism's body.
   a. brick b. cell c. organ d. blood

2) Humans are ……………….. organisms.
   a. unicellular c. multicellular
   b. prokaryote d. simple

3) An unaided human eye can see an object ……….. millimeters long.
   a. 0.01 b. 0.005 c. 0.5 d. 0.001

4) An unaided human eye can't see all the following, except …………………..
   a. an onion's cell c. a bacterial cell
   b. a skin's cell d. a bird's unfertilized egg cell

5) A living organism grows and reproduces by increasing the ……………. of its body cells.
   a. number b. size c. volume d. length

6) All the following are multicellular living organisms, except ……………..
   a. a bean plant b. a cat c. bacteria d. a human

7) All the following are from the basic needs for the cell, except …………….
   a. Water b. oxygen c. food d. carbon dioxide

8) The ……………… regulates the substances that pass in or out of the cell.

a. Nucleus
b. plasma membrane
c. cell wall
d. cytoplasm

9) Which statement about the cells is false?

a. All living organisms are composed of cells.
b. All cells come from existing cells.
c. Most cells are microscopic in size.
d. All cells have a nucleus.

Put (√) or (X):

1- Most cells are usually very small. (√)

2- The unaided human eye can see a bacteria cell. (X)

3- Different living organisms have similar cells that have similar functions. (X)

4- Increasing the number of the living organism's cells occurs during reproduction process only. (√)

5- The cell membrane allows water to enter the cell, but not to leave it. (X)

6- There must be a water imbalance at the two sides of the cell membrane, so that the cell won't burst. (X)

7- The cell membrane allows only the needed substances to enter the cell. (√)

8- Scientists can use a telescope to see the very small cells. (X)

9- An unfertilized bird egg contains more than one egg cell. (X)

10- Multicellular organisms consist of only one single cell, such as the plant cell. (X)

Write the scientific term:

1. They are the building units of life on Earth. (**cells**)
2. They are living organisms, and their bodies consist of more than one cell. (**multicellular organisms**)
3. They are living organisms, and their bodies consist of only one cell. (**unicellular organisms**)
4. It's a device used to see very small cells as a plant cell. (**microscope**)
5. It controls the substances that enter or leave the cell. (**cell membrane**)
6. It's a gas which the cell needs to get energy and perform its vital activities. (**oxygen gas**)
7. They're materials released from the cell. (**waste products**)
8. It's a liquid material that is necessary for the cell to do its function well. (**water**)

Complete the following sentences using the words between the brackets:

(**nucleus - shape – oxygen - energy - cell membrane – size – waste products – food**)

1) Cells in our body are different in **size** and **shape** because they have different functions.
2) All cells are composed of a **cell membrane**.
3) A cell takes in **oxygen** and **food** to get **energy** but it releases **waste products**.
4) Not all cells contain **nucleus**.

Correct the underlined words:

1- Most cells are very **large**, so we can see them with our naked eyes. (**small**)
2- A cell is a **simple** structure that carries out its vital activities. (**complex**)

3- Bacteria are **multicellular** living organisms.

(**unicellular**)

4- Living organisms can be divided into multicellular and unicellular organisms according to the **size** of cells in their bodies. (**number**)

5- The cell will **shrink** when too much water keeps entering it.

(**swell**)

Cross out the odd word:

a) Plant - **Bacteria** - Animal - Human

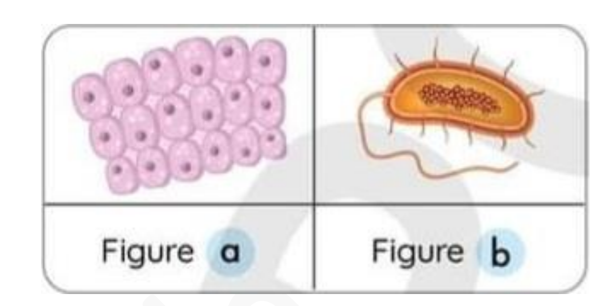
b) A skin cell - A plant cell - An animal's cell - **A bird's unfertilized egg cell**

c) Oxygen - Water - **Carbon dioxide** - Food

Choose from column (A) what suits it in column (B):

Column (A)		Column (B)
1. A cell membrane	**c**	a. is smaller than 0.005 mm long.
2. A bird's unfertilized egg cell	**d**	b. length ranges between 0.005 to 0.1 mm.
3. Bacterium	**a**	c. controls the amount of water that enters the cell.
4. A skin cell	**b**	d. is a very large cell.

Study the following figures, then complete the sentences below:



1) Figure **b** represents a bacterial cell, as it consists of **only one** cell(s).
2) Figure **a** represents the cells of a human skin.

Give reasons for:

1. The cell provides the structure of the living organism's body.
   - Because it's the building blocks of living organisms.

2. A plant is considered a multicellular organism.
   - Because they are organisms that have more than one cell.

3. Bacteria are considered unicellular organisms.
   - Because they are organisms made up of only one cell.

4. You can see a bird's unfertilized egg, but you can't see your skin cell without a microscope.
   - Because the unfertilized bird egg contains only one egg cell and it's very large, but the skin cell is very small and we need microscope to see it.

5. The cell membrane is very important for the cell.
   - Because it regulates which substances can enter or leave the cell.

6. The cells of the same living organisms are different in shape and size.
    - Because they have different functions.

7. The amount of water must be balanced at the two sides of the cell membrane.
    - Because if too much water enters the cell, the cell will swell until it bursts.

What happens if:

1- The cell can't get its basic needs.
   - The cell will not get energy and grow so it will die.

2- The cell membrane is absent in an animal cell.
   - There will be imbalance in leaving or entering the substances.

3- Too much water enters the cell.
   - The cell will swell until it bursts.

Lesson 2

Choose the correct answer:

1) …………………… was the first scientist to use the word "cell".
   a. Newton   **b. Hooke**   c. Edison   d. Einstein

2) The nucleus was discovered during an observation of an enormous ……………….. cell.
   a. animal   b. bacterial   c. human   **d. plant**

3) Scientists concluded that the ……………….. is the basic unit of the organism's structure.
   a. cell   b. organ   c. tissue   d. system

4) All the following are form the parts of a compound microscope, except the ………………..

a. eyepiece
b. objective lenses
c. illuminator
d. objective mirrors

5) The membrane of an onion consists of similar units called …………………

a. cells
b. nuclei
c. organs
d. tissues

6) You can change the power of magnifying of a microscope by using another …………………..

a. objective lens
b. eyepiece
c. mirror
d. arm

Put (√) or (X):

1. Developed microscopes have allowed scientists to make new discoveries. (√)
2. Sometimes a single cell exists on its own as in bacteria. (√)
3. The membrane of an onion consists of different units called cells. (√)
4. The cell in an onion membrane contains many components. (√)
5. A leaf cell and a red blood cell can exist in the same organism. (X)
6. Scientists must be open to new ideas about how cells work. (√)

Write the scientific term:

1- It's a device that can be used to magnify cells. (**microscope**)

2- They're the identical building units of living organisms. (**cells**)

3- It's the type of water added on the samples in microscopes. (**distilled water**)

4- It's a part of the microscope through which you look at the sample. (**eyepiece**)

5- It's a part of the microscope that changes the magnifying power. (**objective lens**)

Correct the underlined words:

I. A complex living system contains **one cell**. (**more than one cell**)

II. We use drops of **tap** water on the sample in a microscope. (**distilled**)

III. We look at the sample through the **objective lens** of the microscope. (**eyepiece**)

IV. We change the magnifying power of the microscope by using a different **mirror**. (**objective lens**)

Cross out the odd word:

- Objective lens - Stage clips - Eyepiece - **Distilled water**
- A leaf cell - A red blood cell - A skin cell - **A bird's unfertilized egg cell**

Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1) The cell **b** 2) A compound microscope **c** 3) Changing the objective lens **a**	a) changes the magnifying power of the microscope. b) is the building unit of the living organism's structure. c) can be used to examine a thin membrane of an onion.

Answer the following questions:

Study the following three figures that represent the samples under a compound microscope, then put true or false:

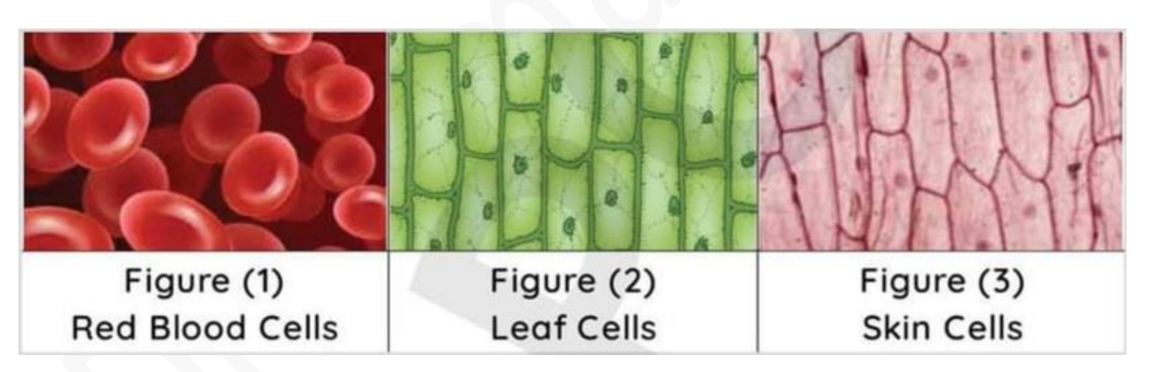
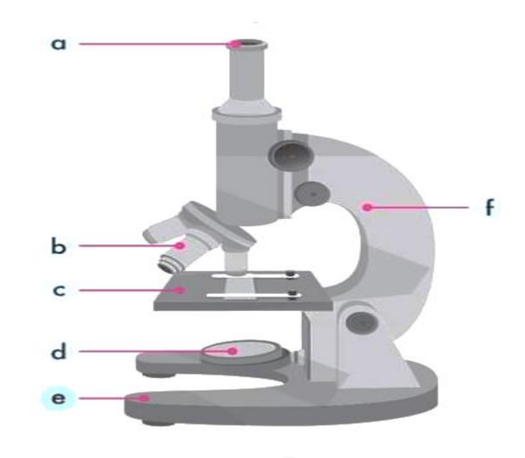


Figure (1) Red Blood Cells	Figure (2) Leaf Cells	Figure (3) Skin Cells

1. All the three samples represent microscopic cells. (**√**)
2. The three samples have different functions. (**√**)
3. All the three samples can exist in the same organism. (**X**)
4. Each figure represents the basic units that form an organism. (**√**)

The following diagram represents the structure of compound microscope.

Write the following labels:



- **a)** Eyepiece
- **b)** Objective lenses
- **c)** Stage
- **d)** illuminator
- **e)** Base

Give a reason for:

The microscope is very important for the biologists and botanists.

- To be able to look at small things in more details.

What happens if:

The microscope wasn't invented.

- Scientists would not be able to discover the cell and its structure.

Lesson 3

Choose the correct answer:

1) The human body is composed of ……………… cells.
   a. 40 hundred   b. 40 thousand   c. 40 million   **d. 40 trillion**

2) All the following are from the cells found in the animal body, except the ………………….
   a. blood cells   c. bone cells
   b. xylem cells   d. muscle cells

3) A/An ………………… is a unicellular simple living organism.
   a. human   b. animal   **c. bacterium**   d. plant

4) The tissue is a set of similar ……………………..
   a. systems   b. cells   c. organs   d. organelles

5) All the following are considered organs, except the …………………
   a. lung   b. heart   c. stomach   d. muscle tissue

6) The systems that keep a multicellular organism alive are divided into ……………… levels.
   a. two   b. three   c. four   d. five

7) All the following organelles are common in plants and animals cells, except the …………………
   a. cytoplasm   c. nucleus
   b. cell wall   d. cell membrane

8) Cell's components are suspended in the …………………..
   a. Nucleus   c. cytoplasm
   b. cell wall   d. cell membrane

9) The ………………. surrounds the plant cell from outside and gives it a definite shape.
   a. Nucleus   c. cytoplasm
   b. cell wall   d. cell membrane

10) The ……………. is a liquid that fills the cavity of the cell and is surrounded by the cell membrane.
   a. Nucleus   c. cytoplasm
   b. cell wall   d. mitochondrion

11) The …………… surrounds the cytoplasm and controls the substances that enter or leave the cell.
   a. cell wall   c. plasma membrane

b. nucleus d. mitochondrion

Put (√) or (x):

1- The number of cells in plants and animals varies from a species to another. (**√**)
2- A stomach consists of a group of tissues. (**√**)
3- The liver is a tissue, while the heart is an organ. (**X**)
4- The respiratory system consists of a set of cells. (**X**)
5- The cell is the smallest building unit of a living organism. (**√**)
6- Both the mitochondrion and plasma membrane are found in plant and animal cells. (**√**)
7- The cell membrane surrounds the plant cell from outside. (**√**)
8- Nucleus, mitochondria and cell membrane float in the cytoplasm. (**X**)
9- The outermost layer of the cell is called "cell membrane". (**√**)

Write the scientific term:

1. It is a structure inside the cell that has a specific function. (**organelle**)
2. It is a set of tissues forming a structural unit to perform a specific function. (**organ**)
3. It is a group of identical cells that perform the same function. (**tissue**)
4. It is a group of organs that perform a specific function. (**system**)
5. It's a liquid in which the cell's organelles float. (**cytoplasm**)
6. It's a feature through which the cell membrane determines which substances will pass through. (**selective permeability**)

7. It's the outer lining of the cell that surrounds the cytoplasm. (**cell membrane**)
8. It's the structure that controls the cell activities. (**nucleus**)
9. They are the powerhouses of energy in the cell. (**mitochondria**)
10. It's a process of using oxygen to get chemical energy from food in the cell. (**cellular respiration**)

Complete the following sentences using the words between the brackets:

(cells - similar - nucleus - organelles – tissues)

1) A cell consists of **organelles** that are functioning in **similar** ways to maintain the cell.
2) An organ is composed of a set of **tissues** that are composed of a group of **cells**.
3) The **nucleus** in the cell is responsible for cell division.

Correct the underlined words:

A) A system is composed of a set of **tissues** that work together. (**organs**)

B) The stomach and lung are considered **systems**. (**organs**)

C) The liver consists of a group of **organelles**. (**tissues**)

D) The **cytoplasm** is the control center of the cell. (**nucleus**)

E) The **cell wall** is a semi-permeable membrane that controls the substances entering the cell. (**cell membrane**)

F) **Photosynthesis process** takes place inside the mitochondria. (**cellular respiration**)

G) The **plant** cell is the building unit of the human body.

(**animal**)

Cross out the odd word:

- Cell membrane - **Cell wall** - Nucleus – Cytoplasm
- Digestive system - Respiratory system - Circulatory system - **Heart**
- **Blood cell** - Stomach - Lung - Liver

Choose from column (A) what suits it in column (B):

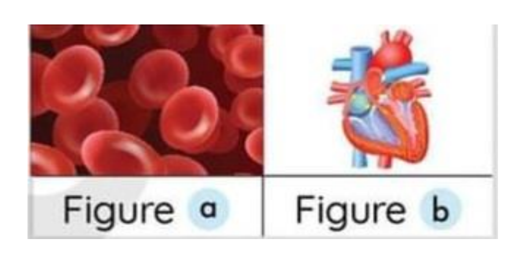
Column (A)		Column (B)
1- Nucleus	a	a- is the control center of the cell.
2- Cell membrane	c	b- supports the plant cell from outside.
3- Cell wall	b	c- controls the substances passing into or out of the cell.

Answer the following questions:

Study the following three figures, then answer:

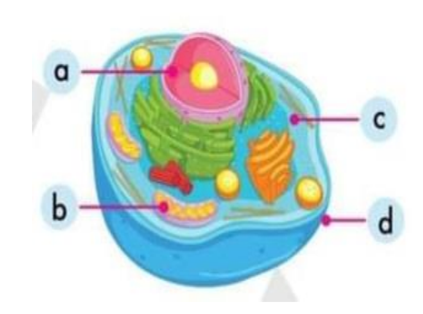
A) Figure (**b**) consists of tissues.

B) Figure (**a**) represents a group of cells.



The following diagram represents the structure of animal cell.

Write the following labels:



a) Nucleus
b) Mitochondria
c) Cytoplasm
d) Cell membrane

Give reasons for:

❖ All organs of the digestive system work together.
- Because each organ performs a specific function to form the digestive system.

❖ The cell membrane has the selective permeability property.
- Because some substances can pass through it, while others can't.

❖ The nucleus has an important role for the cell.
- Because it's responsible for controlling cell activities such as making proteins and cell division.

❖ The mitochondrion has an important role for the cell.
- Because they are powerhouses that supply the cell with energy, and cellular respiration takes place in it.

What happens if:

1) The cell wall in the plant cell is absent.
   - The plant cell will have indefinite shape.

2) The mitochondria are absent from an animal cell.
   - The cell will not supply with energy and cellular respiration doesn't take place.

Lesson 4

Choose the correct answer:

1. Which of the following is found in both plant and animal cells?
   a. Cell membrane
   b. Cell wall
   c. Large, water-filled vacuole
   d. Chloroplast

2. Which two organelles are involved in transportation?
   a. Nucleus and endoplasmic reticulum
   b. Mitochondria and nucleus
   c. Chloroplast and Golgi apparatus
   d. Endoplasmic reticulum and Golgi apparatus

3. Photosynthesis process takes place in the ………………… while cellular respiration takes place in the ……………….
   a. nucleus – cytoplasm
   b. mitochondria – nucleus
   c. mitochondria – chloroplast
   d. chloroplast - mitochondria

4. …………………… are unique structures that exist only in the plant cell.
   a. Mitochondria
   b. Nuclei
   c. Vacuoles
   d. Chloroplasts

5. The plant cell is distinguished from the animal cell by the presence of ………………… and ……………………
   a. chloroplasts - nucleus
   b. nucleus - cell wall
   c. chloroplasts - cell wall
   d. nucleus - cytoplasm

6. The ………………… release(s) energy to power the cell.
   a. Mitochondria
   b. cell wall
   c. nucleus
   d. cell membrane

7. ………………… is the command center of the cell.

a. Chloroplast
b. Mitochondrion
c. Nucleus
d. Cell membrane

8. All the following can be stored in the cell vacuole, except ……………………………
   a. waste b. cytoplasm c. water d. nutrients

9. The ………………. transports proteins in the cell.
   a. Golgi apparatus
   b. Mitochondrion
   c. endoplasmic reticulum
   d. nucleus

10. The ………………… controls the substances that enter or leave the cell.
   a. cytoplasm b. cell wall c. nucleus d. cell membrane

11. The envelopes of the cell used for transporting materials are the ………………
   a. nuclei
   b. chloroplasts
   c. mitochondria
   d. Golgi bodies

12. The ……………… in the cell resembles the powerful brick wall of a city.
   a. Nucleus b. cell wall c. cytoplasm d. cell membrane

13. Golgi apparatus can ………………… inside the cell.
   a. transport protein
   b. package waste
   c. makes proteins
   d. a and b

Put (√) or (x):

1- Both plant and animal cells have common organelles to organize and maintain the cell. (√)

2- Chloroplasts release energy from the food, but mitochondria produce energy from the sunlight. (**X**)

3- Chloroplasts have yellow grains called chlorophyll pigment. (**X**)

4- The outermost layer of a plant cell is the cell wall, but the outermost layer in an animal cell is the cell membrane. (**√**)

5- The animal cell has a definite shape, while the plant cell has an indefinite shape. (**X**)

6- Golgi apparatus can transport materials inside cells, but it can't transport them outside them. (**X**)

7- The plant cell has a larger vacuole than that of the animal cell. (**√**)

8- The cell membrane looks like guards at the gates of a city. (**√**)

Write the scientific term:

1) They help plant and animal cells control, organize, and maintain the cell. (**Organelles**)
2) It controls the functions inside the cell and cell division. (**Nucleus**)
3) They are saclike organelles that store nutrients, water, and waste. (**Vacuole**)
4) It's the fluid found in the cell that holds its organelles. (**Cytoplasm**)
5) They're organelles in the plant cell that convert light energy into sugar. (**Chloroplast**)
6) They're organelles in the plant cell that power the cell with energy. (**Mitochondria**)
7) It's a process that occurs inside the chloroplast. (**Photosynthesis process**)
8) It's a process that occurs inside the mitochondria. (**Cellular respiration**)

Complete the following sentences using the words between the brackets:

(Golgi apparatus - sugar - Mitochondria – chloroplasts – exoskeleton - chlorophyll - Bones - endoplasmic reticulum)

- **Bones** support(s) the fish body shape, while a/an **exoskeleton** supports that of insects.
- In the photosynthesis process, **chlorophyll** absorb(s) sunlight, where **chloroplasts** use(s) it to make the plant's food.
- **Endoplasmic reticulum** transport(s) proteins produced by the **Golgi apparatus** through the cell.
- **Mitochondria** convert(s) **sugar** into energy that is needed for the cell activities.

Correct the underlined words:

- Chloroplasts have a green color due to the presence of **iodine** pigment. (**chlorophyll**)
- A plant cell has a rigid shape due to the presence of the **cell membrane**. (**cell wall**)
- Insects have a hard, shell-like support called **an endoskeleton**. (**exoskeleton**)
- Cytoplasm is a **solid** matter that surrounds the cell's organelles. (**liquid**)
- The endoplasmic reticulum helps in the assembly and transport of **fats** in the cell. (**proteins**)
- **The endoplasmic reticulum** is the post office that packages proteins in the cell. (**Golgi apparatus**)

Cross out the odd word:

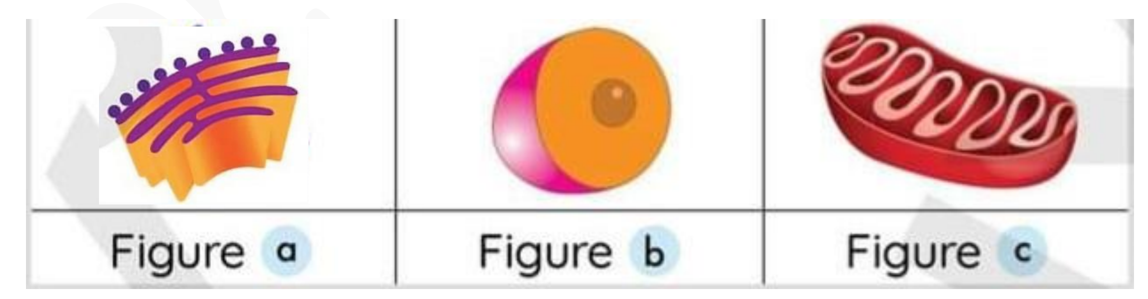
- Nucleus - Endoplasmic reticulum - Mitochondria - **Chloroplasts**
- Horses - **Plants** - Dogs – Insects

Choose from column (A) what suits it in column (B):

Column (A)		Column (B)
1. Mitochondrion	d	a) is the packaging factory for the cell.
2. Golgi apparatus	a	b) is the food factory of the cell.
3. Chloroplast	b	c) resembles the construction worker of a city.
4. Vacuole	e	d) is the powerhouse of the cell.
5. Endoplasmic reticulum	c	e) is considered the storage facility of the cell.
6. Nucleus	f	f) resembles the city hall that controls all the cell activities.

Answer the following questions:

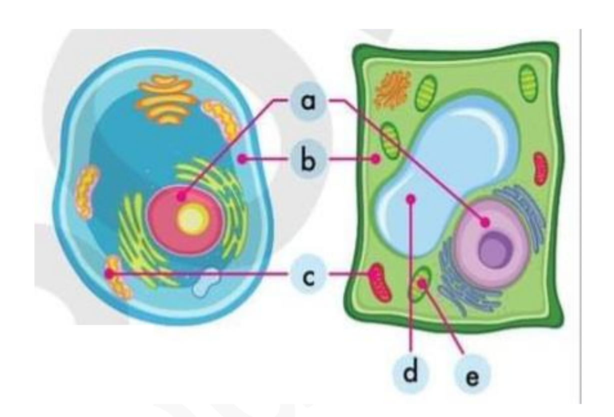
Study the following three figures, then answer:



- Figure (c) converts sugar into energy.
- Figure (b) is considered the protein maker in the cell.
- Figure (a) helps in assembling and transporting proteins.

The following diagrams represent the structure of plant cell and animal cell

Write the following labels:



a) Nucleus
b) Cytoplasm
c) Mitochondria
d) Vacuole
e) Chloroplasts

***Mention the function of parts b and d*.**

Part b (cytoplasm): it's the gelatinous liquid inside the cells in which other cell parts float.
Part d (Vacuole): it is used for the storage of nutrients, water and waste.

Give reasons for:

- Both plant and animal cells have common organelles.
  - Because both of them have cell membrane, cytoplasm, nucleus, mitochondria, endoplasmic reticulum, Golgi apparatus, and vacuole.

- Animals can't make their own food.
  - Because they don't have chloroplasts.

- Nucleus is the command center of the cell.
  - Because it controls the functions inside the cell such as: making proteins and cell division.

- The animal cell has an indefinite shape, but the plant cell has a definite shape.
    - Because the animal cell doesn't have cell wall, but the plant cell has rigid cell wall.

- Animals can keep their shapes.
    - Because some animals have bones, and insects have an exoskeleton.

- The vacuole of the plant cell is larger than that of the animal cell.
    - Because the plant stores a large amount of water in the vacuole.

- Mitochondria are considered the powerhouse of the cell.
    - Because it converts sugar into energy for the cell.

- The Golgi apparatus resembles the post office of a city.
    - Because it helps package nutrients within vital products inside the cell and it helps transport nutrients outside the cell.

- The chloroplasts are the food factories of the cell.
    - Because they contain chlorophyll and carry out the photosynthesis process.

- Endoplasmic reticulum has an important role in the cell.
    - Because it helps in assembling and transporting proteins.

What happens if:

1- Chloroplasts in a plant cell are damaged or functioning improperly.

- The plant will not be able to absorb energy from sunlight to make its own food.

2- Mitochondria stopped converting sugar into energy.

- The cell will not supply with energy and cellular respiration doesn't take place.

3- The endoplasmic reticulum is absent from the cell.

- The cell will not be able to assemble and transport proteins.

4- The Golgi apparatus is absent from the cell.

- The nutrients will not transport outside the cell, and they will not be packaged within vital products inside the cell.

5- The plant has a small vacuole.

- The plant will not be able to store a large amount of water, nutrients and wastes.

Lesson 5 & 6

Choose the correct answer:

1. Cell biologists use microscopes to magnify ………………… to appear larger.

   a. stones b. bricks c. cells d. rocks

2. Cell biologists do experiments and analyze data to study all the following, except …………………..

a. how cells respond to different medicines.
b. how rocks are formed on Earth's surface.
c. how cells can work to repair body parts.
d. how plant cells respond to different environmental factors.

3. To see the structure of a cell under microscope we must color it by using …………………
   a. stains   b. water   c. sunlight   d. vinegar

4. Methylene blue dye helps us to see the …………………… of the cell as a blue area under microscope.
   a. cytoplasm   c. chloroplast
   b. Golgi apparatus   d. nucleus

5. The 3D microscope can help in all the following, except that it helps ……..
   a. cell biologists learning more about cell components.
   b. scientists to know how planets revolve around the sun.
   c. doctors to treat some diseases as cancer.
   d. cell biologists learning more about how cells divide.

Put (√) or (x):

1) Cells are very large, as the diameter of an animal cell is about 0.001 cm. (X)
2) Cell biologists are scientists who study rocks. (X)
3) Cell biologists work in laboratories and do experiments to study how cells work inside living organisms. (√)
4) Cells are usually clear and colorless, so it is easy to see their structures under microscope. (X)
5) The 3D microscope can help doctors to treat cancer disease. (√)

Write the scientific term of each of the following:

1- They are scientists who study cells. (**cell biologists**)
2- A stain that is used to color the nucleus of the cell in blue color. (**methylene blue**)
3- The microscope that helps us to see the top, sides and layers of the cell. (**3D microscope**)

Complete the following sentences using the words below:

(methylene blue - microscope – agriculture - cell biologists - doctors)

A) Cell biologists use **microscope** to magnify cells of bacteria.
B) Cell biologists work in **agriculture** to study plant cells and their respond different environmental factors.
C) Cell biologists work with **doctors** to watch how cells can work to repair the human body parts.
D) To see the nucleus of a cell under microscope, we can stain the cell with **methylene blue**.
E) The 3D microscope can help **cell biologists** learn more about how cells divide.

Give reasons for:

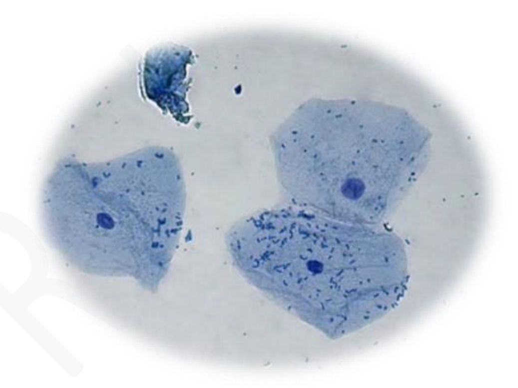
- Some cell biologists work with doctors.
  - **To watch how cells can work to repair the human body parts.**
- We must stain cells before examining them under microscope.
  - **Because the cells are usually clear and colorless and to make their structures more visible.**

What happens if…

We stain a sample of cheek cells with methylene blue dye.

- **We will see the nucleus as a blue area.**

Look at the opposite picture, then complete the following sentences:



Cheek cells

1. These cells are seem large, because they are magnified by using **microscope**.
2. The structure of the cell which appears clearly with blue color in the opposite picture is the **nucleus**.
3. These cells are stained by **methylene blue** dye.

Look at the opposite picture, then answer the following questions: (A) Put (√) or (x):



3D microscope

1. This device helps doctors to treat some diseases such as cancer. (**√**)
2. This device doesn't need a computer to do its functions. (**X**)
3. This device helps cell biologists to see the cells in 3D. (**√**)

(B) Rearrange the following sentences in the right order to show how this device works:

- A computer puts these layers together. (**2**)
- Colors are added to the formed image. (**3**)
- It takes pictures of a cell in layers. (**1**)

Unit 1 – concept 2 - questions

Lesson 1

Choose the correct answer:

1. When you feel nervous, your heartbeats increase, this indicates the interaction between ………………… systems.
   a. digestive and nervous
   b. digestive and circulatory
   c. nervous and circulatory
   d. digestive and respiratory

2. Skeletal system takes nutrients from …………… system for growth of muscles.
   a. circulatory b. digestive c. nervous d. respiratory

3. When you touch a hot cup of tea, …………………… system sends a message to the muscles of your hand to contract.
   a. respiratory b. digestive c. circulatory d. nervous

4. In a dangerous situation, your eyes send the information to the …………………… to perform the suitable action.
   a. brain b. stomach c. lungs d. heart

5. Muscles of stomach and muscles of heart can be controlled by ……………….. system.
   a. digestive b. circulatory c. nervous d. respiratory

6. The nerve cells depend on …………………. systems to get their needed nutrients.
   a. digestive and respiratory
   b. digestive and circulatory
   c. circulatory and respiratory
   d. circulatory and nervous

7. The system which transfers nutrients from the digestive system to the different muscles of the body is the ………………… system.
   a. circulatory c. respiratory
   b. nervous d. excretory

8. In dangerous situations, …………………..
   a. all systems of the body interact together.
   b. circulatory system interacts with digestive system only.
   c. nervous system sends message to digest food in stomach.
   d. respiratory system interacts with circulatory system only.

<u>Put (√) or (x):</u>

1- All systems in your body work together in an integrated way. ( )

2- When you hear a clock alarm, your brain sends a signal to the muscles to move and wake up. ( )

3- In dangerous situations, nervous system only allows your body to face the danger. ( )

4- Digestive system can digest food without the help of nervous system. ( )

5- Muscles of heart are controlled by nervous system. ( )

6- Nutrients reach the nerve cells which found in your hand by the help of circulatory system. ( )

7- Digestive system transfers oxygen gas to all muscles in your body. ( )

Complete the following sentences using the words below:

(body systems – blood – nervous – nutrients – muscles – brain)

1) When you feel nervous, there is an interaction between circulatory system and ……………… system.
2) When you touch a sharp thorn, your hand moves away quickly due to the interaction between nervous system and ………………… in your hand.
3) When you smell a fire smoke, the …………………………. sends a message to your leg muscles to walk toward the fire location.
4) The interaction between …………………… is important in any dangerous situation.
5) Digestive system provides the nerve cells with …………………… which are needed to perform their functions.
6) Nutrients are transmitted from digestive system to nervous system through the …………………………. In the circulatory system.

Give reasons for:

- Digestive system helps skeletal system in fracture healing.

………………………………………………………………………………………………

………………………………………………………………………………………………

- The nerve cells in the nervous system need nutrients.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The importance of nervous system for the muscles of heart.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

<u>What happens to …:</u>

- The brain of a cyclist when he sees a dangerous situation.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

<u>Use the following systems to complete the table below:</u>

(you can use the same system more than once)

(Digestive system – Circulatory system – Nervous system)

Description	Name of system
1. It controls the muscles of stomach.	………………………………………
2. It transmits nutrients from digestive system to the nerve cells.	………………………………………
3. It provides the muscles of heart with its needed food.	………………………………………

4. It controls the muscles of heart.	....
5. They help in providing and transmitting the nutrients to the muscles of arms.	....

Lesson 2

Choose the correct answer:

1. Cells differ from each other in ....
   a. shapes only
   b. sizes only
   c. shapes and sizes
   d. neither shapes nor sizes

2. All the following are from the characteristics of muscle cells, except that they ....
   a. Are in the form of long fibers.
   b. can work alone due to their large sizes.
   c. must be able to store and use energy quickly.
   d. can be bundled together to form tissues.

3. The muscle is considered as ....
   a. a cell
   b. a tissue
   c. an organ
   d. a system

4. Among the organs of musculoskeletal system are ....
   a. muscles and bones of arm.
   b. muscles of arm and lungs.
   c. bones and heart.
   d. lungs and heart.

5. Musculoskeletal system allow the body to …………………
    a. digest food.
    b. move from place to another.
    c. transmit nutrients.
    d. exchange oxygen and carbon dioxide.

6. Your leg moves due to contraction and relaxation of ………………….. connected to the bon of leg.
    a. hairs   b. toes   c. skin   d. muscles

7. When the muscle in front of the upper arm contracts and the muscle in the back of the upper arm relaxes, the forearm moves ……………………
    a. up towards your shoulder.
    b. down towards your shoulder.
    c. up away from your shoulder.
    d. down away from your shoulder.

8. When the muscles in front of the upper arm relax and the muscles in the back of the upper arm contract, the forearm moves ………………………………..
    a. up towards your shoulder.
    b. down towards your shoulder.
    c. up away from your shoulder.
    d. down away from your shoulder.

9. The contraction of muscles moves the bones in ………. only.
    a. one direction   c. four directions
    b. two directions   d. three directions

10. You can move your fingers due to the contraction and relaxation of the skeletal muscles that attached to the …………………… of your fingers.

a. hairs b. bones c. skin d. nails

11. All the following organs belong to musculoskeletal system, except ………………..

a. tendons b. cartilages c. veins d. bones

Choose from column (B) what suits it in column (A):

(A)	(B)
1. A group of similar cells form 2. A group of different tissues form 3. A group of different organs form 4. A group of different systems form	a. organs. b. cells. c. whole body. d. tissues. e. systems.

Put (√) or (x):

1- A group of different tissues can form a system. ( )

2- Muscle cells are in the form of long fibers to allow movement. ( )

3- Muscle cells cannot store and use energy quickly. ( )

4- The muscle is formed from bundles of muscle tissues. ( )

5- Musculoskeletal system consists of muscular system and digestive system. ( )

6- The body can move by the help of the skeletal system only. ( )

7- The forearm moves up towards your shoulder when the muscle in front of the upper arm contracts. (   )
8- Contraction and relaxation of leg muscles allow the bones of leg to move. (   )
9- Musculoskeletal system consists of muscles and bones only. (   )

Write the scientific term of each of the following:

- They are cells in the form of long fibers to allow movement. (…………………………………………..)
- It is the organ which contracts and relaxes to help in the movement of the body. (…………………………………….)
- The system which helps the body to move. (…………………………………….)
- They are muscles that attached to the bones of skeletal system. (…………………………………………..)

Complete the following sentences:

1) The body consists of a group of ……………………….. which consists of a group of organs.
2) Skeletal muscles can store and use ……………………….. quickly.
3) Bundles of muscle tissues are organized to form the …………………………….

4) Musculoskeletal system consists of two systems which are and ……………… system and ……………………. system that allow the …………………… of the body.
5) When you lift a bag by your hand toward your shoulder, muscles in front of the upper arm ……………………….. and muscles in the back of the upper arm ……………………………
6) When a muscle contracts, it can exert ………………………………
7) When you push a door with your hand, the skeletal muscles that found in your arm work in pairs and move in …………………………… directions.

<u>Give reasons for:</u>

- Muscle cells are in the form of long fibers.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Muscle cells don't work alone.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Skeletal system cannot do the function of movement without muscular system.

………………………………………………………………………………………………

………………………………………………………………………………………………

What happens to…:

- ❖ Your leg if the muscles found in it are damaged.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- ❖ The muscles in front of the upper arm and muscles in the back of the upper a when the forearm moves down away from your shoulder.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Look at the following figures, then complete the following sentences:



A) The forearm in figure ………… moves up toward your shoulder.

B) The forearm in figure ………… moves down away from your shoulder.

C) The muscles in front of the upper arm contract in figure ………….. and relax in figure ………….

D) The muscles in the back of the upper arm contract in figure …………. and relax in figure ………….

Lesson 3

Choose the correct answer:

1. Among the muscles which you cannot control their movement are …………………
   a. hand muscles c. leg muscles
   b. eyelid muscles d. arm muscles

2. Cardiac muscles are type of involuntary muscles which form the …………………
   a. stomach b. intestine c. lungs d. heart

3. Muscles of heart ………………… to pump the blood carrying oxygen to all body cells.
   a. contract only c. contract and relax
   b. relax only d. neither contract nor relax

4. Among the organs which contain both involuntary and voluntary muscles is the ………………..
   a. heart b. arm c. eye d. leg

5. Skeletal muscles work in pairs when …………………
   a. moving your hands towards your shoulder
   b. pumping blood to all the body parts.
   c. transmitting food to all the body parts.
   d. closing your eyelid to allow you blink.

6. The system which helps your body gets ready to respond in different situation: by secreting hormones is the .... system.
   a. digestive b. endocrine c. circulatory d. nervous

7. Among the functions of endocrine system is ……………………
   a. transmitting food to the nervous system.
   b. controlling the muscles of stomach.
   c. controlling the body temperature and blood pressure.
   d. providing the muscular system with its needed food.

8. All the following are happened by the help of endocrine system to face or to r away from danger, except ....
   a. contraction of your muscles.
   b. increasing your breathing rate.
   c. increasing your heartbeats.
   d. digestion of food that you eat.

9. All the following are from types of blood vessels, except ………….........
   a. arteries b. heart c. veins d. blood capillaries

10. Circulatory system can transport all the following substances through all the body parts, except ……………..
    a. nutrients b. gases c. hormones d. bones

11. When you face a dangerous situation, circulatory system do all the following, except …………………
    a. your heartbeats increase.
    b. muscles of your body relax.
    c. heart pumps more blood to the muscles.
    d. the blood pressure increases.

12. Among the organs which belong to respiratory system is ……………
   a. stomach   b. heart   c. lung   d. brain

13. The system which provides your body with oxygen gas and gets rid of carbon dioxide gas is ……………. system.
   a. respiratory   b. nervous   c. endocrine   e. circulatory

14. The lungs take in air when the diaphragm …………………, while they release the air when the diaphragm …………..
   a. contracts – contracts   c. relaxes - relaxes
   b. contracts – relaxes   d. relaxes - contracts

15. The system which helps the respiratory system in transporting oxygen gas from lungs to all the body organs is the ………… system.
   a. digestive   b. nervous   c. endocrine   d. circulatory

16. All the following muscles work in pairs as one muscle contracts, while the other muscle relaxes, <u>except</u> the …………..
   a. upper arm muscles   c. neck muscles
   b. cardiac muscles   d. forearm muscles.

<u>Put (√) or (x):</u>

1- Cardiac muscles are considered as voluntary muscles. ( )

2- Heart is made of a type of involuntary muscles known as skeletal muscles. ( )

3- Cardiac muscles contract and relax all the time without stopping. ( )

4- The muscles that help you move your eyes in different directions are considered as voluntary muscles. ( )

5- All skeletal muscles are considered as involuntary muscles and work by contraction. ( )

6- Endocrine system secretes hormones that control the increasing of your breathing rate during danger. ( )

7- The heart begins to beat quickly during normal situations. ( )

8- When the heartbeats increase, the blood pressure increases also. ( )

9- Trachea is the only airway through which oxygen passes to reach the lungs. ( )

10- In dangerous situations, the body sends more oxygenated blood to the muscles and brain to face the danger. ( )

11- Blood transports oxygen gas only to all the body organs and tissues. ( )

12- Forearm muscles are considered as voluntary muscles. ( )

<u>Write the scientific term of each of the following :</u>

- They are muscles that move automatically, and you cannot control their movement. (………………………………..)
- They are muscles that you can control their movement. (………………………………….)

- A type of involuntary muscles which form the heart that contract and relax all time without stopping.

  (……………………………………….)

- They are muscles which allow the movement of the bones of skeletal system. (…………………………………….)

- It is the system that secretes hormones to control the body temperature and the blood pressure.

  (…………………………………………)

- It is the system which consists of the heart and blood vessels that allow blood to flow through the body.

  (……………………………………………….)

- It is the system which consists of lungs and other airways.

  (…………………………………………………)

Complete the following sentences:

1) Muscles of eyelid that allow you blink many times in one minute are considered as ……………………. muscles, while the muscles that help your eyeball to move in different directions are considered as ……………………. muscles.
2) The muscles of heart are called …………………….. muscles and they are considered as a type of ……………….. muscles.
3) All muscles can do the function of movement by …………………………….

4) Endocrine system consists of …………… which secrete …………………….. that control bod temperature and blood ………………………………..

5) In dangerous situations, endocrine system secretes hormones which allow your …………………… contract and increasing the rate of your ……………………. and …………………………

6) In dangerous situations, heart pumps more blood which carries …………………, …………………. and ……………………… to the muscles and other organs.

7) The lungs release the air that rich in ……………… gas, when the …………………… muscle relaxes.

8) When your heartbeats and breathing rate increase, your body sends more ……………………….. blood to the muscles and brain to face the danger.

9) Among the skeletal muscles that you can control their movement are upper arm muscles, ……………………….. and ……………………………………

Give reasons for:

- Cardiac muscles are considered as involuntary muscles.

……………………………………………………………………………………………

……………………………………………………………………………………………

- Cardiac muscles contract and relax without stopping.

……………………………………………………………………………………………

……………………………………………………………………………………………

- The muscles that surround the eyeball are considered as voluntary muscles.

……………………………………………………………………………………………

……………………………………………………………………………………………

- When the body faces a danger, the heartbeats increase.

……………………………………………………………………………………………

……………………………………………………………………………………………

<u>What happens to…:</u>

- The human body if the cardiac muscles don't contract and relax for a long period of time.

……………………………………………………………………………………………

……………………………………………………………………………………………

- The human body when the heartbeats increase during danger.

……………………………………………………………………………………………

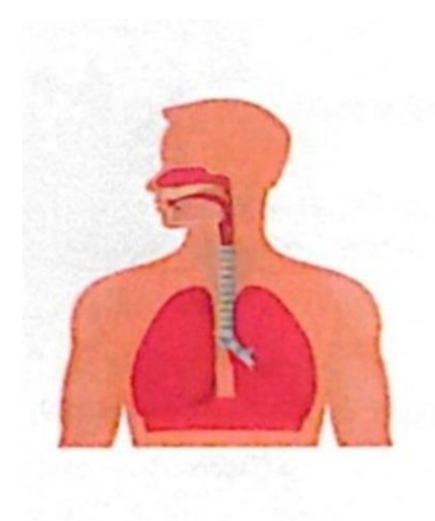
……………………………………………………………………………………………

❖ The lungs when the diaphragm muscle contracts.

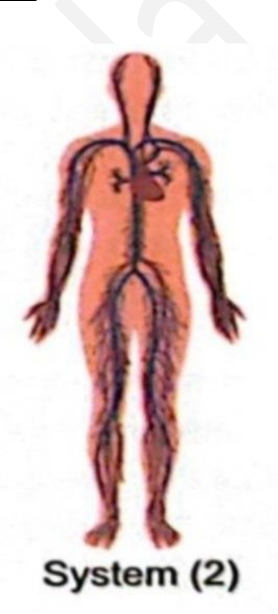
………………………………………………………………………………………………………

………………………………………………………………………………………………………

<u>The following figures show some human body systems, if a person is subjected to an accident while he is riding a bicycle, complete the sentences below:</u>



System (1)



System (2)

A) System number……………. helps endocrine system in carrying hormones to the muscles and brain of the person.

B) Heart that belongs to system number …………… begins to beat quickly.

C) System number …………… contains diaphragm muscle which contracts and relaxes many times to increase the breathing rate.

D) Both system number (1) and (2) help …………………… gas to reach muscles and brain of the person.

Lesson 4

Choose the correct answer :

1. The systems of the human body get their needed energy from …………….
   a. the sun b. water c. food d. carbon dioxide

2. All the following are from the nutrients that the food contains, except ………………
   a. carbohydrates b. oxygen gas c. fats d. proteins

3. The system which converts the complex food into simpler substances that the body can use for energy and growth is the ……………. system.
   a. respiratory b. nervous c. circulatory d. digestive

4. You can use your …………….. muscles to help the teeth chew the food.
   a. eye b. cardiac c. jaw d. hand

5. The system which helps the digestive system during chewing the food by secreting enzymes in your mouth is the ……………… system.
   a. endocrine b. circulatory c. respiratory d. nervous

6. The function of saliva inside your mouth is …………………
   a. cutting up the food into smaller parts
   b. softening the food and breaking it down
   c. transporting the food into stomach

d. transporting the food through body organs.

7. The organ which belongs to the digestive system and secretes fluids contain an acid and some enzymes is the ……………………………..
   a. esophagus   b. stomach   c. small intestine   d. mouth

8. In small intestine, …………………. help(s) in breaking down of food by secreting some enzymes.
   a. pancreas only   c. pancreas and gallbladder
   b. gallbladder only   d. pancreas and lungs

9. Absorption of nutrients inside the body starts in the ……………..… organ.
   a. large intestine   c. heart
   b. small intestine   d. stomach

10. Walls of small intestine contain …………………….. which responsible for absorbing nutrients of digested food.
    a. blood vessels   b. hairs   c. glands   d. nephrons

11. Blood carries ………………… formed inside small intestine to all the body organs.
    a. feces   b. undigested food   c. bones   d. nutrients

12. The large intestine absorbs ……………. from the undigested food.
    a. nutrients   b. water   c. blood   d. urea

13. The part of large intestine which stores the feces until it leaves the body is the …………………

a. rectum b. colon c. esophagus d. anus

14. The organs which can store glucose and convert it into glycogen are ………………….
    a. liver and pancreas
    b. muscles and stomach
    c. esophagus and stomach
    d. liver and muscles

15. The system which helps the digestive system in transporting the nutrients to all different body organs is the …………… system.
    a. nervous b. respiratory c. circulatory d. excretory

16. The body gets rid of waste materials by ……………. process.
    a. digestion b. excretion c. respiration d. sensation

17. The excretion process is necessary to ……….
    a. digest the food that you eat.
    b. allow your body to move.
    c. transport the nutrients inside your body.
    d. remove the waste products from your body.

18. All the following are responsible for excretion process, except …………….
    a. digestive system
    b. skin
    c. respiratory system
    d. urinary system

19. The organ which is responsible for secreting sweat is the …………
    a. esophagus b. stomach c. skin d. kidney

20. All the following are from the waste materials which are produced by your body, <u>except</u> …………..
    a. urine b. oxygen gas c. carbon dioxide d. sweat

21. Among the organs which belong to urinary system are ....
   a. stomach and kidneys c. kidneys and bladder
   b. ureters and gallbladder d. urethra and heart

22. The two kidneys play an important role in the filtration of .... inside your body.
   a. water b. enzyme c. acid d. blood

23. The blood which carries the waste materials, enters each kidney through a large ....
   a. vein b. artery c. blood capillary d. ureter

24. Urea is formed due to the breaking down of .... inside the body cells.
   a. Carbohydrates b. fats c. acids d. proteins

25. The tube which transports the urine from the kidney to the bladder is the ....
   a. vein b. urethra c. ureter d. artery

26. The process of expelling urine from the body is called .... process.
   a. urination b. respiration c. digestion d. sensation

<u>Put (√) or (x):</u>

1- Systems get their needed energy from the food we eat. (   )
2- The simple substances must be converted into complex nutrients to be used by the body cells. (   )
3- Digestion begins when the food enters esophagus. (   )

4- Saliva is a liquid which is secreted by endocrine system inside your mouth. ( )

5- The acid and enzymes which are secreted inside stomach lead to more breaking down of food. ( )

6- Inside large intestine, enzymes which are secreted from pancreas and gallbladder help in the chemical breakdown of food. ( )

7- Absorption of digested food starts in the small intestine. ( )

8- The digested food enters the colon as a soupy mixture. ( )

9- Colon absorbs most of water from the undigested food that leaves the body. ( )

10- The feces leave the body through a bony opening known as anus. ( )

11- Circulatory system transports the digested food to different body organs. ( )

12- All nutrients that are absorbed from small intestine are stored as fats inside the body. ( )

13- Glycogen is converted into glucose and stored in liver and muscles. ( )

14- When your body needs energy, liver and muscles convert glycogen into glucose again. ( )

15- Excretion process is necessary to convert complex food into simpler substances. (   )

16- If your body doesn't get rid of waste, you will be healthy. (   )

17- The main waste product which is expelled by respiratory system is the urea. (   )

18- The two kidneys remove waste materials from the blood. (   )

19- Nephron helps in the filtration of blood from urea. (   )

20- Urine is expelled outside the body through urethra. (   )

21- Blood cells and proteins are too small, so they can pass through the nephrons of kidneys. (   )

Write the scientific term of each of the following:

- The system which converts the complex food into simpler substances that the body can use to get energy. (......................................)
- The process of breaking down the complex food into simpler substances. (....)
- A liquid in your mouth contains an enzyme which helps in digestion process. (.........................)
- An organ in which absorption of nutrients starts.

(………………………)

- The organ which absorbs most of water from the undigested food. (……………………...)
- The last part of large intestine that stores the feces until it leaves the body. (………………………………)
- A substance that is stored in liver and muscles, then converted into glucose when your body needs energy.

  (………………………………..)
- It is a system that is responsible for storing and getting rid of waste materials produced from cells.

  (……………………………………)
- It is the process of removing the waste products resulting from burning food inside the body cells through their membranes. (……………………………………)
- The organ which helps in excretion of sweat through the pores that are found in it. (…………………………………..)
- The system that is responsible for excretion of carbon dioxide gas. (……………………………………..)
- It is a microscopic filter that is found in the two kidneys and filters the blood from waste materials.

  (………………………………..)
- A substance which is formed due to the breakdown of proteins inside the body cells. (………………………………)

- It is the process of expelling urine from the body.

(………………………………………)

Complete the following sentences:

1) The food we eat contains different nutrients such as ……………………….. , ……………………… and ………………………
2) Your body cells can use simple substances that are converted from complex …………….. to get their needed ……………….. to do their functions.
3) The system which helps your teeth and jaw move to chew the food is the ………………… system.
4) Stomach contains an ………………… and some …………………… that lead to more food breakdown.
5) Inside small intestine, …………………….. and …………………….. secrete enzymes to help in the chemical breakdown of food.
6) After completing the digestion of food, the walls of …………….. absorb the nutrients through …………………….. that carry them to all the body parts.
7) Undigested food passes to …………………….. intestine which absorbs most of …………………… from it, leaving the solid waste that is known as …………………… or …………………………..
8) The muscular opening that the feces passes through it to outside the body is known as ………………………

9) Cells can use …………………… sugar at once to get their needed energy, and this sugar can be converted into ……………. and stored in liver and ………………………
10) Excretion process happens when …….…………….. system collects the waste materials produced by ……………….. and expels them outside the body.
11) Some waste products leave your body in the form of ………………… through your skin.
12) Respiratory system removes …………………….. gas from the body as a waste product.
13) Urinary system removes waste material from the blood in the form of ……………………..
14) Blood which carries waste materials reach the kidney through a large ……………………….
15) Filtration of blood occurs inside the ……...………. by the help of a microscopic filter known as ………………………
16) When you eat a piece of meat, proteins are broken down and form a waste material known as ………………………..
17) Urine is composed of …………………, other waste products and ………………………
18) Urine leaves each kidney through ……………………… and is collected in the ……………………… until it is expelled outside the body.

19) Blood cells and ………………….. are ………………. in size, so they cannot pass through nephrons, and stay in the body.

Give reasons for:

- The body needs to convert complex food into simpler substance.

……………………………………………………………………………………………

……………………………………………………………………………………………

- Saliva plays an important role in digestion of food inside the mouth.

……………………………………………………………………………………………

……………………………………………………………………………………………

- Stomach secretes a digestive fluid when the food reach it.

……………………………………………………………………………………………

……………………………………………………………………………………………

- Walls of small intestine contain blood vessels.

……………………………………………………………………………………………

……………………………………………………………………………………………

- Undigested food becomes solid wastes inside the large intestine.

……………………………………………………………………………………………

……………………………………………………………………………………………

- The liver and muscles convert the stored glycogen into glucose sugar.

…………………………………………………………………………………………

…………………………………………………………………………………………

- Importance of excretion process to your body.

…………………………………………………………………………………………

…………………………………………………………………………………………

- The digestive system doesn't share in excretion process.

…………………………………………………………………………………………

…………………………………………………………………………………………

- The two kidneys contain many nephrons.

…………………………………………………………………………………………

…………………………………………………………………………………………

- Formation of urea inside the body of human.

…………………………………………………………………………………………

…………………………………………………………………………………………

What happens if…:

❖ Complex nutrients don't convert into simple substances inside your body.

…………………………………………………………………………………………

………………………………………………………………………………………………

- ❖ Saliva is not secreted during chewing the food inside your mouth.

………………………………………………………………………………………………

………………………………………………………………………………………………

- ❖ Pancreas and gallbladder don't secrete their enzymes in small intestine.

………………………………………………………………………………………………

………………………………………………………………………………………………

- ❖ Your body doesn't get rid of waste.

………………………………………………………………………………………………

………………………………………………………………………………………………

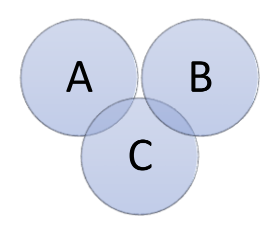
- ❖ The blood that carries waste materials passes through nephrons of the two kidneys.

………………………………………………………………………………………………

………………………………………………………………………………………………

<u>Look at the following diagrams that represent the sharing of some body systems to do some processes, then use the words below to complete the following sentences:</u>

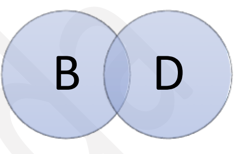
(**respiratory system – skin - urinary system - circulatory system**)



Excretion process

D A

Transportation of waste materials and urination



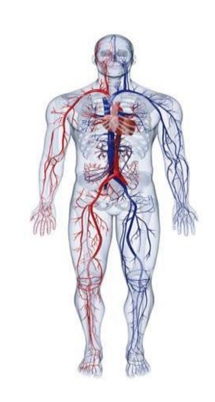
Respiration process and transportation of gases

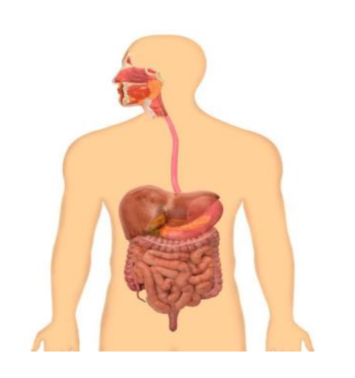
1. Letter (A) represents ………………….
2. Letter (B) represents ……………………
3. Letter © represents …………………….
4. Letter (D) represents …………………….

<u>Write each of the following organs below the system that belongs to:</u>

(**Heart - Lungs - Kidneys – Stomach**)









…………………….. …………………….. …………………….. ……………………..

Lesson 5

Choose the correct answer :

1. Engineers design special devices to work instead of …………………….. organ which filter the blood from waste materials.
   a. stomach b. heart c. kidney d. lung

2. Nephrons play an important role in ……………………
   a. secreting hormones to control the body functions.
   b. controlling the movement of body from place to another.
   c. breaking down the complex food into simple nutrients.
   d. filtering the blood from waste materials.

3. Among the substances which cannot pass through the kidneys' nephrons are ……………………….
   a. blood cells and urea c. proteins and urea
   b. blood cells and proteins d. water and urea

4. Urination process happens by the help of …………………. system.
   a. digestive b. urinary c. respiratory d. skeletal

5. The two kidneys remove waste materials as …………………, and expel them in the form of urine.
   a. water and urea
   b. urea and blood cells
   c. water and proteins
   d. proteins and blood cells

<u>Put (√) or (x):</u>

1- Kidneys are considered as a filtering system for the blood. ( )

2- People whose kidneys are not working properly must use other devices to filter their blood from waste. ( )

3- Proteins can pass through nephrons during filtration of blood in the two kidneys. ( )

4- Studying a kidney model can save time, money and effort. ( )

5- The two kidneys remove waste materials from undigested food which come out in the form of urine. ( )

<u>Complete the following sentences using the words below:</u>

(**kidney model - proteins – blood - urine - nephrons – urea**)

2) People whose kidneys are not working well, their …………………….. cannot be filtered well.

3) Some substances can pass through nephrons as ………………….., while other substances cannot pass through nephrons as ……………………

4) The microscopic filters which are found inside the two kidneys are called ……………………..
5) We can save people's life when studying a ……………………
instead of a real kidney.
6) Waste materials that are removed by the help of urinary system are coming in the form of ………………………..

<u>Give a reason for :</u>

- Blood cells and proteins cannot pass through the kidney's nephrons.

…………………………………………………………………………………………

…………………………………………………………………………………………

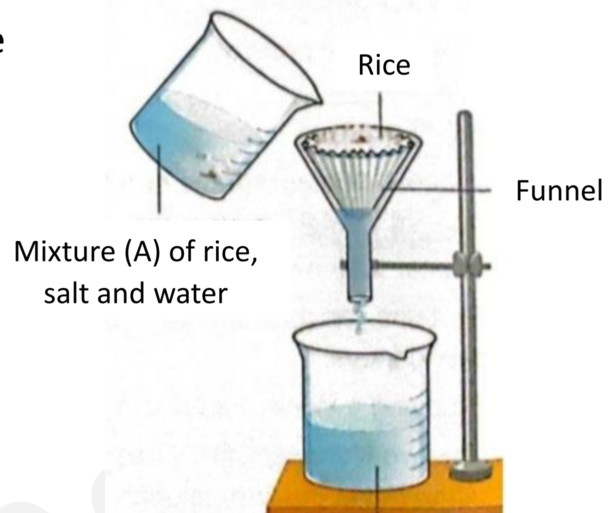
<u>What happens if…:</u>

- ❖ The blood does not pass through the two kidneys during its circulation inside the human body.

…………………………………………………………………………………………

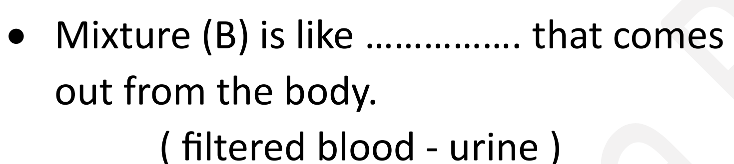
…………………………………………………………………………………………

Look at the opposite figure, then choose the correct answer from those between brackets:



- The filter in the opposite figure is like ………. organ in the urinary system.
  (stomach – kidney)

- Mixture (A) is like ………… which is found in the body.
  (blood before filtering - blood after filtering)



- Mixture (B) is like ……………. that comes out from the body.
  (filtered blood - urine)

- Rice in the opposite figure is like ………. which cannot pass through nephrons during filtration of blood.
  (proteins – urea)

Lesson 6

Choose the correct answer:

1. Diabetes disease occurs due to a disturbance in one organ of ………………… system.
   a. respiratory   b. nervous   c. endocrine   d. urinary

2. The organ which is responsible for secreting insulin hormone is the …………………
   a. gallbladder   b. pancreas   c. liver   d. stomach

3. Insulin hormone is responsible for regulating the level of ……………………. in blood.
   a. proteins b. fats c. water d. sugar

4. Pancreas belongs to ……………. system and its secretions help in completing ……………………… process.
   a. endocrine – digestion c. circulatory - respiration
   b. digestive – urination d. endocrine - sensation

5. People who suffer from diabetes can use the insulin pump device that injects the body automatically with …………..
   a. sugar b. water c. insulin d. carbohydrate

<u>Put (√) or (X):</u>

1- Diabetes disease is one of the disorders of the respiratory system. (   )

2- Pancreas secretes hormone to regulate sugar level in the blood. (   )

3- If pancreas cannot do its function correctly, the sugar level in blood doesn't affect. (   )

4- The body uses sugar to get its needed energy. (   )

5- The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. (   )

6- Researchers are working to develop an artificial pancreas instead of the insulin pump device. (   )

Write the scientific term of each of the following:

- The organ that is responsible for regulating the sugar level in blood. (……………………………)
- A hormone that controls the level of sugar in the human blood. (……………………………………)
- The system which helps in regulating sugar level in the blood by secreting a specific hormone.
  (……………………………………………)
- A device that is used by diabetics to help them control the blood sugar levels with automatic injections of insulin.
  (…………………………………………)
- A disease that is resulting from the disorder of secreting insulin hormone by pancreas. (…………………………………)

Complete the following sentences using the words below:

(**insulin pump – endocrine - pancreas – blood – diabetes - insulin - energy**)

2) People that have a problem in secreting insulin hormone will be infected by ………………….. disease.
3) Pancreas is one of the organs of …………………… system that produces ………………….. hormone.
4) Insulin regulates the sugar level in the …………………….

5) Diabetics can control the blood sugar levels by using .... device automatic injects the body with insulin.
6) Researchers are working to develop an artificial .... to pump insulin internally inside the human body.
7) The human body uses sugar to get its needed .... for doing all vital activities.

__Give a reason for :__

- Diabetics must give themselves regular shots of insulin.

....

....

__What happens if...:__

❖ Pancreas doesn't make its function correctly.

....

....

Unit 1 – concept 2 - answers

Lesson 1

Choose the correct answer:

1. When you feel nervous, your heartbeats increase, this indicates the interaction between ………………… systems.
   a. digestive and nervous
   b. digestive and circulatory
   c. nervous and circulatory
   d. digestive and respiratory

2. Skeletal system takes nutrients from ………….. system for growth of muscles.
   a. circulatory
   b. digestive
   c. nervous
   d. respiratory

3. When you touch a hot cup of tea, …………………… system sends a message to the muscles of your hand to contract.
   a. respiratory
   b. digestive
   c. circulatory
   d. nervous

4. In a dangerous situation, your eyes send the information to the …………………… to perform the suitable action.
   a. brain
   b. stomach
   c. lungs
   d. heart

5. Muscles of stomach and muscles of heart can be controlled by ………………. system.
   a. digestive
   b. circulatory
   c. nervous
   d. respiratory

6. The nerve cells depend on …………………. systems to get their needed nutrients.
   a. digestive and respiratory
   b. digestive and circulatory
   c. circulatory and respiratory
   d. circulatory and nervous

7. The system which transfers nutrients from the digestive system to the different muscles of the body is the ………………… system.
   a. circulatory
   b. nervous
   c. respiratory
   d. excretory

8. In dangerous situations, …………………..
   a. all systems of the body interact together.
   b. circulatory system interacts with digestive system only.
   c. nervous system sends message to digest food in stomach.
   d. respiratory system interacts with circulatory system only.

Put (√) or (x):

1- All systems in your body work together in an integrated way. (√)
2- When you hear a clock alarm, your brain sends a signal to the muscles to move and wake up. (√)
3- In dangerous situations, nervous system only allows your body to face the danger. (X)
4- Digestive system can digest food without the help of nervous system. (X)
5- Muscles of heart are controlled by nervous system. (√)
6- Nutrients reach the nerve cells which found in your hand by the help of circulatory system. (√)
7- Digestive system transfers oxygen gas to all muscles in your body. (X)

Complete the following sentences using the words below:

(body systems – blood – nervous – nutrients – muscles – brain)

1) When you feel nervous, there is an interaction between circulatory system and **nervous** system.
2) When you touch a sharp thorn, your hand moves away quickly due to the interaction between nervous system and **muscles** in your hand.
3) When you smell a fire smoke, the **brain** sends a message to your leg muscles to walk toward the fire location.
4) The interaction between **body systems** is important in any dangerous situation.
5) Digestive system provides the nerve cells with **nutrients** which are needed to perform their functions.
6) Nutrients are transmitted from digestive system to nervous system through the **blood** in the circulatory system.

Give reasons for:

- Digestive system helps skeletal system in fracture healing.
  - **Because digestive system provides the skeletal system with nutrients needed for fracture healing.**

- The nerve cells in the nervous system need nutrients.
  - **To perform their functions.**

- The importance of nervous system for the muscles of heart.
  - **Because nervous system controls the movement of muscles of heart.**

What happens to …:

- The brain of a cyclist when he sees a dangerous situation.
  - **The brain sends a signal to the muscles that contract and allow his body to face the danger.**

Use the following systems to complete the table below:

(you can use the same system more than once)

(Digestive system – Circulatory system – Nervous system)

Description	Name of system
1. It controls the muscles of stomach.	Nervous system
2. It transmits nutrients from digestive system to the nerve cells.	Circulatory system
3. It provides the muscles of heart with its needed food.	Digestive system
4. It controls the muscles of heart.	Nervous system
5. They help in providing and transmitting the nutrients to the muscles of arms.	Digestive system and circulatory system

Lesson 2

Choose the correct answer:

1. Cells differ from each other in ....
   a. shapes only
   b. sizes only
   c. shapes and sizes
   d. neither shapes nor sizes

2. All the following are from the characteristics of muscle cells, except that they ....
   a. Are in the form of long fibers.
   b. can work alone due to their large sizes.
   c. must be able to store and use energy quickly.
   d. can be bundled together to form tissues.

3. The muscle is considered as ....
   a. a cell   b. a tissue   c. an organ   d. a system

4. Among the organs of musculoskeletal system are ....
   a. muscles and bones of arm.
   b. muscles of arm and lungs.
   c. bones and heart.
   d. lungs and heart.

5. Musculoskeletal system allow the body to ....
   a. digest food.
   b. move from place to another.
   c. transmit nutrients.
   d. exchange oxygen and carbon dioxide.

6. Your leg moves due to contraction and relaxation of .... connected to the bon of leg.
   a. hairs   b. toes   c. skin   d. muscles

7. When the muscle in front of the upper arm contracts and the muscle in the back of the upper arm relaxes, the forearm moves ....
   a. up towards your shoulder.
   b. down towards your shoulder.
   c. up away from your shoulder.
   d. down away from your shoulder.

8. When the muscles in front of the upper arm relax and the muscles in the back of the upper arm contract, the forearm moves ....
   a. up towards your shoulder.
   b. down towards your shoulder.

c. up away from your shoulder.
d. down away from your shoulder.

9. The contraction of muscles moves the bones in ………. only.
   a. one direction   c. four directions
   b. two directions   d. three directions

10. You can move your fingers due to the contraction and relaxation of the skeletal muscles that attached to the …………………… of your fingers.
   a. hairs   b. bones   c. skin   d. nails

11. All the following organs belong to musculoskeletal system, except ……………….
   a. tendons   b. cartilages   c. veins   d. bones

Choose from column (B) what suits it in column (A):

(A)		(B)
1. A group of similar cells form	d	a. organs.
2. A group of different tissues form	a	b. cells.
3. A group of different organs form	e	c. whole body.
4. A group of different systems form	c	d. tissues.
		e. systems.

Put (√) or (x):

1- A group of different tissues can form a system. (X)
2- Muscle cells are in the form of long fibers to allow movement. (√)
3- Muscle cells cannot store and use energy quickly. (X)
4- The muscle is formed from bundles of muscle tissues. (√)

5- Musculoskeletal system consists of muscular system and digestive system. (**X**)
6- The body can move by the help of the skeletal system only. (**X**)
7- The forearm moves up towards your shoulder when the muscle in front of the upper arm contracts. (**√**)
8- Contraction and relaxation of leg muscles allow the bones of leg to move. (**√**)
9- Musculoskeletal system consists of muscles and bones only. (**X**)

Write the scientific term of each of the following:

- They are cells in the form of long fibers to allow movement. (**muscle cells**)
- It is the organ which contracts and relaxes to help in the movement of the body. (**muscles**)
- The system which helps the body to move. (**musculoskeletal system**)
- They are muscles that attached to the bones of skeletal system. (**skeletal muscles**)

Complete the following sentences:

1) The body consists of a group of **systems** which consists of a group of organs.
2) Skeletal muscles can store and use **energy** quickly.
3) Bundles of muscle tissues are organized to form the **muscles**.
4) Musculoskeletal system consists of two systems which are and **muscular** system and **skeletal** system that allow the **movement** of the body.
5) When you lift a bag by your hand toward your shoulder, muscles in front of the upper arm **contract** and muscles in the back of the upper arm **relax**.
6) When a muscle contracts, it can exert **force**.

7) When you push a door with your hand, the skeletal muscles that found in your arm work in pairs and move in **opposite** directions.

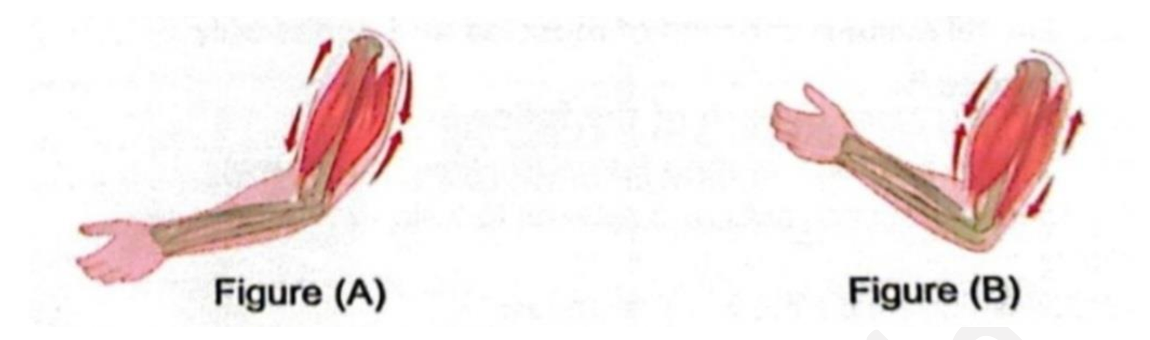
Give reasons for:

- Muscle cells are in the form of long fibers.
  - **To allow the movement.**
- Muscle cells don't work alone.
  - **Because the size of the muscle cell is very small.**
- Skeletal system cannot do the function of movement without muscular system.
  - **Because the skeletal muscles that attached to the bones of skeletal system allow these bones to move.**

What happens to…:

- ❖ Your leg if the muscles found in it are damaged.
  - **The leg cannot move.**
- ❖ The muscles in front of the upper arm and muscles in the back of the upper a when the forearm moves down away from your shoulder.
  - **The muscles in front of the upper arm relax and the muscles in the back of the upper arm contract.**

Look at the following figures, then complete the following sentences:



A) The forearm in figure **B** moves up toward your shoulder.
B) The forearm in figure **A** moves down away from your shoulder.
C) The muscles in front of the upper arm contract in figure **B** and relax in figure **A** .
D) The muscles in the back of the upper arm contract in figure **A** and relax in figure **B**.

Lesson 3

Choose the correct answer:

1. Among the muscles which you cannot control their movement are …………………
   a. hand muscles c. leg muscles
   b. eyelid muscles d. arm muscles

2. Cardiac muscles are type of involuntary muscles which form the …………………
   a. stomach b. intestine c. lungs d. heart

3. Muscles of heart ………………… to pump the blood carrying oxygen to all body cells.
   a. contract only c. contract and relax
   b. relax only d. neither contract nor relax

4. Among the organs which contain both involuntary and voluntary muscles is the ....
   a. heart   b. arm   c. eye   d. leg

5. Skeletal muscles work in pairs when ....
   a. moving your hands towards your shoulder
   b. pumping blood to all the body parts.
   c. transmitting food to all the body parts.
   d. closing your eyelid to allow you blink.

6. The system which helps your body gets ready to respond in different situation: by secreting hormones is the .... system.
   a. digestive   b. endocrine   c. circulatory   d. nervous

7. Among the functions of endocrine system is ....
   a. transmitting food to the nervous system.
   b. controlling the muscles of stomach.
   c. controlling the body temperature and blood pressure.
   d. providing the muscular system with its needed food.

8. All the following are happened by the help of endocrine system to face or to r away from danger, <u>except</u> ....
   a. contraction of your muscles.
   b. increasing your breathing rate.
   c. increasing your heartbeats.
   d. digestion of food that you eat.

9. All the following are from types of blood vessels, <u>except</u> ....
   a. arteries   b. heart   c. veins   d. blood capillaries

10. Circulatory system can transport all the following substances through all the body parts, <u>except</u> ………………

a. nutrients b. gases c. hormones d. bones

11. When you face a dangerous situation, circulatory system do all the following, <u>except</u> …………………

a. your heartbeats increase.
b. muscles of your body relax.
c. heart pumps more blood to the muscles.
d. the blood pressure increases.

12. Among the organs which belong to respiratory system is ……………

a. stomach b. heart c. lung d. brain

13. The system which provides your body with oxygen gas and gets rid of carbon dioxide gas is …………… system.

a. respiratory b. nervous c. endocrine e. circulatory

14. The lungs take in air when the diaphragm …………………, while they release the air when the diaphragm ………….

a. contracts – contracts c. relaxes - relaxes
b. contracts – relaxes d. relaxes - contracts

15. The system which helps the respiratory system in transporting oxygen gas from lungs to all the body organs is the ………… system.

a. digestive b. nervous c. endocrine d. circulatory

16. All the following muscles work in pairs as one muscle contracts, while the other muscle relaxes, <u>except</u> the ………….

a. upper arm muscles c. neck muscles

b. cardiac muscles   d. forearm muscles.

Put (√) or (x):

1- Cardiac muscles are considered as voluntary muscles. (X)
2- Heart is made of a type of involuntary muscles known as skeletal muscles. (X)
3- Cardiac muscles contract and relax all the time without stopping. (√)
4- The muscles that help you move your eyes in different directions are considered as voluntary muscles. (√)
5- All skeletal muscles are considered as involuntary muscles and work by contraction. (X)
6- Endocrine system secretes hormones that control the increasing of your breathing rate during danger. (√)
7- The heart begins to beat quickly during normal situations. (X)
8- When the heartbeats increase, the blood pressure increases also. (√)
9- Trachea is the only airway through which oxygen passes to reach the lungs. (X)
10- In dangerous situations, the body sends more oxygenated blood to the muscles and brain to face the danger. (√)
11- Blood transports oxygen gas only to all the body organs and tissues. (X)
12- Forearm muscles are considered as voluntary muscles. (√)

Write the scientific term of each of the following:

- They are muscles that move automatically, and you cannot control their movement. (**involuntary muscles**)
- They are muscles that you can control their movement. (**voluntary muscles**)

- A type of involuntary muscles which form the heart that contract and relax all time without stopping.
  (**cardiac muscles**)
- They are muscles which allow the movement of the bones of skeletal system. (**skeletal muscles**)
- It is the system that secretes hormones to control the body temperature and the blood pressure.
  (**endocrine system**)
- It is the system which consists of the heart and blood vessels that allow blood to flow through the body.
  (**circulatory system**)
- It is the system which consists of lungs and other airways.
  (**respiratory system**)

Complete the following sentences:

1) Muscles of eyelid that allow you blink many times in one minute are considered as **involuntary** muscles, while the muscles that help your eyeball to move in different directions are considered as **voluntary** muscles.
2) The muscles of heart are called **cardiac** muscles and they are considered as a type of **involuntary** muscles.
3) All muscles can do the function of movement by **contraction**.
4) Endocrine system consists of **glands** which secrete **hormones** that control bod temperature and blood **pressure**.
5) In dangerous situations, endocrine system secretes hormones which allow your **muscles** contract and increasing the rate of your **breathing** and **heartbeats**.
6) In dangerous situations, heart pumps more blood which carries **gases**, **nutrients** and **hormones** to the muscles and other organs.
7) The lungs release the air that rich in **carbon dioxide** gas, when the **diaphragm** muscle relaxes.

8) When your heartbeats and breathing rate increase, your body sends more **oxygenated** blood to the muscles and brain to face the danger.
9) Among the skeletal muscles that you can control their movement are upper arm muscles, **neck muscles** and **forearm muscles**.

Give reasons for:

- Cardiac muscles are considered as involuntary muscles.
  - **Because cardiac muscles move automatically which means you cannot control their movement.**
- Cardiac muscles contract and relax without stopping.
  - **To allow the heart pumps the blood carrying oxygen to all body cells.**
- The muscles that surround the eyeball are considered as voluntary muscles.
  - **Because you can control the movement of eyeball muscles.**
- When the body faces a danger, the heartbeats increase.
  - **Because endocrine system secretes hormones which cause increasing of heartbeats rate to face danger.**

What happens to…:

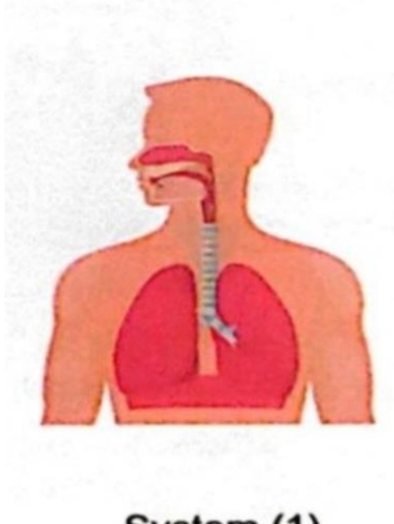
- The human body if the cardiac muscles don't contract and relax for a long period of time.
  - **The heart cannot pump the blood carrying oxygen to all body cells and the human will die.**
- The human body when the heartbeats increase during danger.

- **The heart pumps more blood to the muscles, the heart and other organs, and also the blood pressure increases.**

❖ The lungs when the diaphragm muscle contracts.

- **The lungs take in the air rich in oxygen gas.**

The following figures show some human body systems, if a person is subjected to an accident while he is riding a bicycle, complete the sentences below:



System (1)



System (2)

A) System number **2** helps endocrine system in carrying hormones to the muscles and brain of the person.

B) Heart that belongs to system number **2** begins to beat quickly.

C) System number **1** contains diaphragm muscle which contracts and relaxes many times to increase the breathing rate.

D) Both system number (1) and (2) help **oxygen** gas to reach muscles and brain of the person.

Lesson 4

Choose the correct answer :

1. The systems of the human body get their needed energy from ....
   a. the sun   b. water   c. food   d. carbon dioxide

2. All the following are from the nutrients that the food contains, except ....
   a. carbohydrates   b. oxygen gas   c. fats   d. proteins

3. The system which converts the complex food into simpler substances that the body can use for energy and growth is the .... system.
   a. respiratory   b. nervous   c. circulatory   d. digestive

4. You can use your .... muscles to help the teeth chew the food.
   a. eye   b. cardiac   c. jaw   d. hand

5. The system which helps the digestive system during chewing the food by secreting enzymes in your mouth is the .... system.
   a. endocrine   b. circulatory   c. respiratory   d. nervous

6. The function of saliva inside your mouth is ....
   a. cutting up the food into smaller parts
   b. softening the food and breaking it down
   c. transporting the food into stomach
   d. transporting the food through body organs.

7. The organ which belongs to the digestive system and secretes fluids contain an acid and some enzymes is the ……………………………

   a. esophagus b. stomach c. small intestine d. mouth

8. In small intestine, ………………… help(s) in breaking down of food by secreting some enzymes.

   a. pancreas only c. pancreas and gallbladder
   b. gallbladder only d. pancreas and lungs

9. Absorption of nutrients inside the body starts in the ……………… organ.

   a. large intestine c. heart
   b. small intestine d. stomach

10. Walls of small intestine contain …………………… which responsible for absorbing nutrients of digested food.

    a. blood vessels b. hairs c. glands d. nephrons

11. Blood carries ………………. formed inside small intestine to all the body organs.

    a. feces b. undigested food c. bones d. nutrients

12. The large intestine absorbs ……………. from the undigested food.

    a. nutrients b. water c. blood d. urea

13. The part of large intestine which stores the feces until it leaves the body is the ………………..

    a. rectum b. colon c. esophagus d. anus

14. The organs which can store glucose and convert it into glycogen are ………………….

    a. liver and pancreas c. esophagus and stomach

b. muscles and stomach d. liver and muscles

15. The system which helps the digestive system in transporting the nutrients to all different body organs is the …………… system.

a. nervous b. respiratory c. circulatory d. excretory

16. The body gets rid of waste materials by ……………. process.

a. digestion b. excretion c. respiration d. sensation

17. The excretion process is necessary to ……….

a. digest the food that you eat.
b. allow your body to move.
c. transport the nutrients inside your body.
d. remove the waste products from your body.

18. All the following are responsible for excretion process, except …………….

a. digestive system c. respiratory system
b. skin d. urinary system

19. The organ which is responsible for secreting sweat is the …………

a. esophagus b. stomach c. skin d. kidney

20. All the following are from the waste materials which are produced by your body, <u>except</u> ………….

a. urine b. oxygen gas c. carbon dioxide d. sweat

21. Among the organs which belong to urinary system are ……….

a. stomach and kidneys c. kidneys and bladder
b. ureters and gallbladder d. urethra and heart

22. The two kidneys play an important role in the filtration of ……………. inside your body.

a. water   b. enzyme   c. acid   **d. blood**

23. The blood which carries the waste materials, enters each kidney through a large …………..

a. vein   **b. artery**   c. blood capillary   d. ureter

24. Urea is formed due to the breaking down of ……… inside the body cells.

a. Carbohydrates   b. fats   c. acids   **d. proteins**

25. The tube which transports the urine from the kidney to the bladder is the ……………..

a. vein   b. urethra   **c. ureter**   d. artery

26. The process of expelling urine from the body is called ……………… process.

a. urination   b. respiration   c. digestion   d. sensation

Put (√) or (x):

1- Systems get their needed energy from the food we eat. (√)
2- The simple substances must be converted into complex nutrients to be used by the body cells. (X)
3- Digestion begins when the food enters esophagus. (X)
4- Saliva is a liquid which is secreted by endocrine system inside your mouth. (√)
5- The acid and enzymes which are secreted inside stomach lead to more breaking down of food. (√)
6- Inside large intestine, enzymes which are secreted from pancreas and gallbladder help in the chemical breakdown of food. (X)
7- Absorption of digested food starts in the small intestine.

(√)

8- The digested food enters the colon as a soupy mixture. (X)

9- Colon absorbs most of water from the undigested food that leaves the body. (√)

10- The feces leave the body through a bony opening known as anus. (X)

11- Circulatory system transports the digested food to different body organs. (√)

12- All nutrients that are absorbed from small intestine are stored as fats inside the body. (X)

13- Glycogen is converted into glucose and stored in liver and muscles. (X)

14- When your body needs energy, liver and muscles convert glycogen into glucose again. (√)

15- Excretion process is necessary to convert complex food into simpler substances. (X)

16- If your body doesn't get rid of waste, you will be healthy. (X)

17- The main waste product which is expelled by respiratory system is the urea. (X)

18- The two kidneys remove waste materials from the blood. (√)

19- Nephron helps in the filtration of blood from urea. (√)

20- Urine is expelled outside the body through urethra. (√)

21- Blood cells and proteins are too small, so they can pass through the nephrons of kidneys. (X)

Write the scientific term of each of the following:

- The system which converts the complex food into simpler substances that the body can use to get energy. (**digestive system**)

- The process of breaking down the complex food into simpler substances. (**digestion process**)
- A liquid in your mouth contains an enzyme which helps in digestion process. (**saliva**)
- An organ in which absorption of nutrients starts. (**small intestine**)
- The organ which absorbs most of water from the undigested food. (**large intestine**)
- The last part of large intestine that stores the feces until it leaves the body. (**rectum**)
- A substance that is stored in liver and muscles, then converted into glucose when your body needs energy. (**glycogen**)
- It is a system that is responsible for storing and getting rid of waste materials produced from cells. (**excretory system**)
- It is the process of removing the waste products resulting from burning food inside the body cells through their membranes. (**excretion process**)
- The organ which helps in excretion of sweat through the pores that are found in it. (**skin**)
- The system that is responsible for excretion of carbon dioxide gas. (**respiratory system**)
- It is a microscopic filter that is found in the two kidneys and filters the blood from waste materials. (**nephron**)
- A substance which is formed due to the breakdown of proteins inside the body cells. (**urea**)
- It is the process of expelling urine from the body. (**urination process**)

Complete the following sentences:

1) The food we eat contains different nutrients such as **carbohydrates** , **fats** and **proteins**.

2) Your body cells can use simple substances that are converted from complex **food** to get their needed **energy** to do their functions.
3) The system which helps your teeth and jaw move to chew the food is the **muscular (musculoskeletal)** system.
4) Stomach contains an **acid** and some **enzymes** that lead to more food breakdown.
5) Inside small intestine, **pancreas** and **gallbladder** secrete enzymes to help in the chemical breakdown of food.
6) After completing the digestion of food, the walls of **small intestine** absorb the nutrients through **blood vessels** that carry them to all the body parts.
7) Undigested food passes to **large** intestine which absorbs most of **water** from it, leaving the solid waste that is known as **feces** or **stool**.
8) The muscular opening that the feces passes through it to outside the body is known as **anus**.
9) Cells can use **glucose** sugar at once to get their needed energy, and this sugar can be converted into **glycogen** and stored in liver and **muscles**.
10) Excretion process happens when **excretory** system collects the waste materials produced by **cells** and expels them outside the body.
11) Some waste products leave your body in the form of **sweat** through your skin.
12) Respiratory system removes **carbon dioxide** gas from the body as a waste product.
13) Urinary system removes waste material from the blood in the form of **urine**.
14) Blood which carries waste materials reach the kidney through a large **artery**.
15) Filtration of blood occurs inside the **kidneys** by the help of a microscopic filter known as **nephron**.
16) When you eat a piece of meat, proteins are broken down and form a waste material known as **urea**.

17) Urine is composed of **urea**, other waste products and **water**.
18) Urine leaves each kidney through **ureter** and is collected in the **bladder** until it is expelled outside the body.
19) Blood cells and **proteins** are **large** in size, so they cannot pass through nephrons, and stay in the body.

Give reasons for:

- The body needs to convert complex food into simpler substance.
  - **Because the body cells use this simpler substance to get energy and grow.**

- Saliva plays an important role in digestion of food inside the mouth.
  - **Because saliva can easily soften the food and starts the chemical breakdown of food.**

- Stomach secretes a digestive fluid when the food reach it.
  - **To allow more food breakdown.**

- Walls of small intestine contain blood vessels.
  - **To carry the digested food (nutrients) to all body parts after completing digestion process.**

- Undigested food becomes solid wastes inside the large intestine.
  - **Because large intestine (colon) absorbs most of water from the undigested food.**

- The liver and muscles convert the stored glycogen into glucose sugar.
  - **To provide the body with its needed energy.**

- Importance of excretion process to your body.
    - **Because the excretory system collects the waste materials produced by cells and remove them from the body to keep the body healthy.**

- The digestive system doesn't share in excretion process.
    - **Because it doesn’t work on the waste materials produced from burning food inside the body cells.**

- The two kidneys contain many nephrons.
    - **To filter the blood and remove harmful substances from the body.**

- Formation of urea inside the body of human.
    - **Due to the breakdown of proteins inside the body cells.**

What happens if…:

- Complex nutrients don't convert into simple substances inside your body.
    - **They cannot be used by body cells to get energy to grow.**

- Saliva is not secreted during chewing the food inside your mouth.
    - **The food cannot be easily softened and chemical breakdown of food will not happen.**

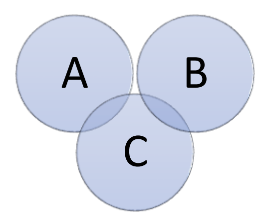
- Pancreas and gallbladder don't secrete their enzymes in small intestine.
    - **The chemical breakdown of food will not happen.**

- Your body doesn't get rid of waste.
    - **The body will get sick.**

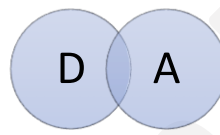
- The blood that carries waste materials passes through nephrons of the two kidneys.
    - **The blood will be filtered from harmful substances.**

Look at the following diagrams that represent the sharing of some body systems to do some processes, then use the words below to complete the following sentences:

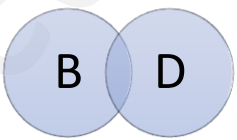
(**respiratory system – skin - urinary system - circulatory system**)



Excretion process



Transportation of waste materials and urination process



Respiration process and transportation of gases

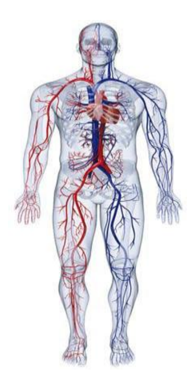
1. Letter (A) represents **urinary system**.
2. Letter (B) represents **respiratory system**.
3. Letter © represents **skin**.
4. Letter (D) represents **circulatory system**.

Write each of the following organs below the system that belongs to:

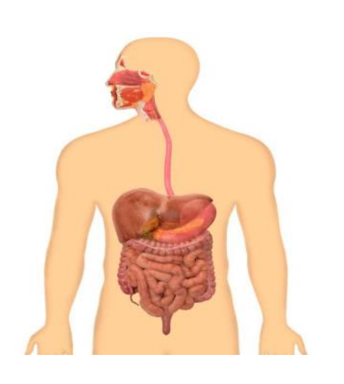
(**Heart - Lungs - Kidneys – Stomach**)







Heart



Stomach



Lungs

Lesson 5

Choose the correct answer :

1. Engineers design special devices to work instead of ……………………. organ which filter the blood from waste materials.
   a. stomach b. heart c. kidney d. lung

2. Nephrons play an important role in …………………..
   a. secreting hormones to control the body functions.
   b. controlling the movement of body from place to another.
   c. breaking down the complex food into simple nutrients.
   d. filtering the blood from waste materials.

3. Among the substances which cannot pass through the kidneys' nephrons are ………………………
   a. blood cells and urea
   b. blood cells and proteins
   c. proteins and urea
   d. water and urea

4. Urination process happens by the help of ………………… system.
   a. digestive b. urinary c. respiratory d. skeletal

5. The two kidneys remove waste materials as ………………., and expel them in the form of urine.
   a. water and urea
   b. urea and blood cells
   c. water and proteins
   d. proteins and blood cells

Put (√) or (x):

1- Kidneys are considered as a filtering system for the blood. (√)
2- People whose kidneys are not working properly must use other devices to filter their blood from waste. (√)
3- Proteins can pass through nephrons during filtration of blood in the two kidneys. (X)
4- Studying a kidney model can save time, money and effort. (√)
5- The two kidneys remove waste materials from undigested food which come out in the form of urine. (X)

Complete the following sentences using the words below:

(**kidney model - proteins – blood - urine - nephrons – urea**)

1) People whose kidneys are not working well, their **blood** cannot be filtered well.
2) Some substances can pass through nephrons as **urea** while other substances cannot pass through nephrons as **proteins**.
3) The microscopic filters which are found inside the two kidneys are called **nephrons**.
4) We can save people's life when studying a **kidney model** instead of a real kidney.
5) Waste materials that are removed by the help of urinary system are coming in the form of **urine**.

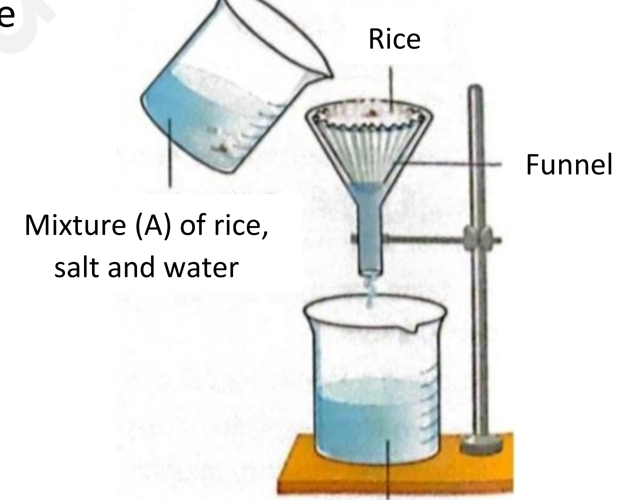
Give a reason for :

- Blood cells and proteins cannot pass through the kidney's nephrons.
    - **Because they are too large.**

What happens if…:

- The blood does not pass through the two kidneys during its circulation inside the human body.
    - **The blood will not be filtered from the waste materials and the body will get sick.**

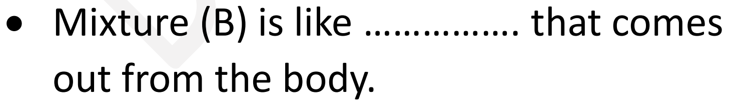
Look at the opposite figure, then choose the correct answer from those between brackets:

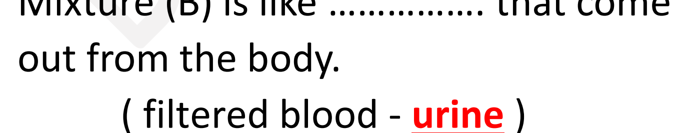


- The filter in the opposite figure is like ………. organ in the urinary system.
    (stomach – **kidney**)

- Mixture (A) is like ……….. which is found in the body.
    (**blood before filtering** - blood after filtering)

- Mixture (B) is like ……………. that comes out from the body.





    (filtered blood - **urine**)

- Rice in the opposite figure is like ………. which cannot pass through nephrons during filtration of blood.
    (**proteins** – urea)

Lesson 6

Choose the correct answer:

1. Diabetes disease occurs due to a disturbance in one organ of ………………… system.
   a. respiratory b. nervous **c. endocrine** d. urinary

2. The organ which is responsible for secreting insulin hormone is the …………………
   a. gallbladder **b. pancreas** c. liver d. stomach

3. Insulin hormone is responsible for regulating the level of …………………….. in blood.
   a. proteins b. fats c. water **d. sugar**

4. Pancreas belongs to ……………. system and its secretions help in completing ……………………… process.
   a. endocrine – digestion c. circulatory - respiration
   b. digestive – urination d. endocrine - sensation

5. People who suffer from diabetes can use the insulin pump device that injects the body automatically with ……………
   a. sugar b. water **c. insulin** d. carbohydrate

Put (√) or (X):

1- Diabetes disease is one of the disorders of the respiratory system. (X)
2- Pancreas secretes hormone to regulate sugar level in the blood. (√)
3- If pancreas cannot do its function correctly, the sugar level in blood doesn't affect. (X)
4- The body uses sugar to get its needed energy. (√)

5- The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. (**X**)

6- Researchers are working to develop an artificial pancreas instead of the insulin pump device. (**√**)

Write the scientific term of each of the following:

- The organ that is responsible for regulating the sugar level in blood. (**pancreas**)
- A hormone that controls the level of sugar in the human blood. (**insulin hormone**)
- The system which helps in regulating sugar level in the blood by secreting a specific hormone. (**endocrine system**)
- A device that is used by diabetics to help them control the blood sugar levels with automatic injections of insulin. (**insulin pump**)
- A disease that is resulting from the disorder of secreting insulin hormone by pancreas. (**diabetes**)

Complete the following sentences using the words below:

(**insulin pump – endocrine - pancreas – blood – diabetes - insulin - energy**)

1) People that have a problem in secreting insulin hormone will be infected by **diabetes** disease.
2) Pancreas is one of the organs of **endocrine** system that produces **insulin** hormone.
3) Insulin regulates the sugar level in the **blood**.
4) Diabetics can control the blood sugar levels by using **insulin pump** device automatic injects the body with insulin.

5) Researchers are working to develop an artificial **pancreas** to pump insulin internally inside the human body.
6) The human body uses sugar to get its needed **energy** for doing all vital activities.

Give a reason for :

- Diabetics must give themselves regular shots of insulin.
  - **To regulate the level of sugar in the blood.**

What happens if…:

- Pancreas doesn't make its function correctly.
  - **The person will be infected with diabetes disease.**

Concept 1

Lesson 1 exercises

Choose the correct answer

1. The smallest tiny structures that build up all living organism's bodies are.....................

a. systems b. cells. c. organs d. bricks.

2. We can see the cell of............... without using a microscope.

a. bacteria b. plant c. human d. bird's egg

3. the .... is responsible for the entry and exit of into and f the cell.

a. cell membrane b. muscle cell c. nucleus d. bone cell

4. The number of cells which build up a baby's body is................... which build up his father's body.

a. more than b. less than c. equal to d. double

5. The structure which is present in plant cell and not in animal cell is........................

a. cell membrane only. b. cell wall only

c. cell membrane and nucleus d. cell wall and nucleus.

6. The cell needs................... to get its needed energy and to stay alive.

a. oxygen only b. water only

c. food and water only d. food, oxygen and water

7. Growth of a living organism is resulted from increasing the.................... of cells in its body

a. length b. size. c. number d. mass

8. The body of............. composed of one cell only

a. human b. bacteria c. a big tree d. an elephant

9. All the following living organisms bodies are build up of many cells...except........

a. human. b. fish. c. plant. d. bacteria.

Put(√) or (X):

1. We can see the cells of all living o s with the eye. ( )
2. All living organisms are similar in that they are made up of one cell only. ( )
3. The new cells are formed from other cells existed in the body of a living organism. ( )
4. All animal cells have a nucleus. ( )
5. The cells that are present in different living organisms are not similar. ( )
6 Growth of living organisms depends on increasing the number of cell in living organism's body. ( )
7. The cell get its energy from nutrients only. ( )
8. The cell membrane allow water to go inside and outside the cell. ( )
9. Cell is the building unit of both living organisms and non-living things ( )
10. The cells that build up a fish body are similar to that of onion plant. ( )

Write the scientific term of each of the fallowing

1. The main building unit of the living organisms body that can do all vital processes.
2. The component of cell that allows water to enter and exit the cell.
3. A device that is used to see the structure of living organisms' cells

4. Living organisms which contain cell wall in the structure of their cells and most of them have a green color

4. Complete the following sentences:

1. Some cells may be large enough to see with our naked eye such as ....

2. Plant cell has..................... which is not found in animal cell.

3. Human body cells need food and oxygen to get ,,,,,,,,,,,,,,,,,, which is needed to do all vital processes.

4 Your body grows up due to the increase in number of your body.....................

5. All cells allow water to go inside and outside them through...............

6. To see the structure of bacteria, we need to use.................................

Give reasons for:

1. The cell needs energy.

....

2. The cell allows water to go outside it.

....

3. You cannot see the body of bacteria with your naked eye

....

What happens if...?

1. There is much water enters the cell.

....

2.The cell doesn't get its needs of nutrients, oxygen and water

....

3. The number of cells increased in the body of a baby

……

Look at the opposite figure, then answer the following questions

1. This device is called……………………..

2. If the examined cell has a cell wall it may be a cell of……….

a. lion's body b. leaf

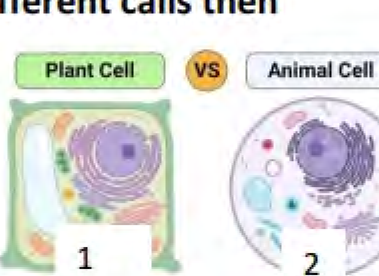
c. human body d. mouse body.

3. This device must be used to see the structure of all the following cells, except……………………

a. plant cells. b. human body cells.

c. bacteria cells d. unfertilized bird's egg

Look at the opposite figure, which show the structure of different calls then complete the sentences below



1. The cell wall is found only in cell number…………………

2. By examining a part of your skin under microscope you can see the same structure of the cell number…………………..



Lesson 2 exercises

Choose the correct answer:

1. Microscopes help scientists to discover that................ is the building unit of living organisms bodies

   a. brick b. cell c. the Sun d. energy

2. The body of simple living organisms as bacteria consists of..................

   a. one cell only b. many cells c. different cells d. ten cells only

3 You can see the cells of all the following under microscope, except..........

   a. Onion b. human skin c. leaf d. stone

4. All the following are from parts of microscope, except..................

   a. eyepiece b. stage c. covers d. mirror.

5. When you examine a piece of onion under microscope using the low power objective lens, you will see the cells of onion in................ size

   a. small b. medium c. big d. very big

6. The modern microscope help scientists to discover all the following information about the cell, except that.................

   A. the cell is the building unit of living organisms bodies

   b. some simple living organisms consists of one cell only

   c. living organisms that contain complex systems consists of many

   d. all living cells have the same parts which have the same function

Put (√)or (x):

1. Robert Hooke used his microscope to observe cells of some samples plant parts ( )

2. The body of a living organism that contains complex systems consists of one cell only ( )

3. All objective lenses of microscope have the same focusing power. ( )

4. The modern microscopes help scientists to discover more information about the call. ( )

5. We can see the examined sample in bigger size when using the high power objective lens ( )

6. The function of coarse focus and fine focus is making the image of sample very clear under microscope ( )

Complete the following sentences using the words below:

(low power-objective lenses-the cell-small-living organisms)

1. Robert Hooke named the tiny particles that he saw under his microscope With …………………..

2. The cell is the building unit of ………………………..bodies

3. Different focusing power of………………….. allow us to see the components of cells

4. You can see cells of an examined sample in…………………..size by using the objective lens of the microscope

Give reasons for:

1. Scientists tend to use microscopes in their researches

………

2. We must rotate the coarse focus and fine focus during examining a sample under microscope under microscope

What happens if...?

1. Scientists was not invented the microscopes

………

2. You examine a sample of plant cells lens of using the low power objective microscope

………

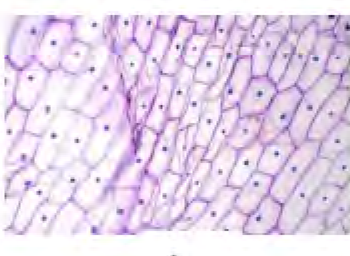
Look at the opposite figures, then answer the following questions

1. The opposite figures represent,,,,,,,,,,,,,,,,,,,,,,,,,

which are the building unit of a plant.

2. Which figure indicates that we use the low power objective lens of a microscope? (Give reason for your answer).

3. Which figure indicates that we use the high power objective lens of a microscope? Give reason for your answer).



1



2

Lesson 3 exercises

Choose the correct answer:

1. The body of unicellular organism consists of ……….

a. three cells only b. one cell only. c. six cells only d. many cells

2. All the following organisms are examples of multicellular organisms, except……………….

a. human b. horse c. bacteria d. apple tree

3. Which of the following is the correct arrangement of the structure of most of multicellular organisms bodes?

a. Similar cells→ Organs →Tissues. →Systems

b. Similar cells. → Tissues→ Organs→ Systems

c. Organs→ Tissues→ Systems →Similar cells

d. Tissues. → Similar cells→ Organs→ Systems

4. Stomach is composed of a group of different…………………

a. bacteria. b. systems. c. organs. d. tissues.

5 All the following parts are from the main parts of animal cell, except…………….

a. cell membrane b. cell wall c. cytoplasm d. nucleus

6. The gelatinous liquid which is found inside the cell is known as……………….

a. nucleus. b. cytoplasm c. cell membrane d. organelles

7. The structure of plant cell which is made up of cellulose is the…………….

a. cell membrane b. cell wall. c. cytoplasm d. nucleus

8. Plant cell has the ability to make the photosynthesis process due to the presence of……………. inside it

a. mitochondria b. chloroplasts c. nucleus d. cytoplasm

9. The organelles which provide the cell with the needed energy are called………………

a. endoplasmic reticulum b. mitochondria

c. Golgi apparatus d. cell membrane

10. Selective permeability of cell membrane means that cell membrane controls……………….

a. the energy which is produced inside the cell.

b. the food which is consumed by the cell

c. the substances which are transported inside the cell

d. the substances that can enter or leave the cell

11. All the following are from functions of cell membrane of animal cell, except That……

a. it protects the cell.

b. it has the selective permeability feature.

c. it provides the cell with the needed energy

d. it surrounds the cell from outside

12. The two cell organelles which are responsible for transportation process are…………….

a. mitochondria and golgi apparatus.

b. endoplasmic reticulum and golgi apparatus.

c. endoplasmic reticulum and mitochondria.

d. mitochondria and chloroplasts.

13. Nucleus is responsible for controlling..................

a. formation of proteins only

b. cell division only

c. formation of proteins and cell division

d. formation of proteins and energy production.

Put (√) or (x)

1. Bacteria and horse are considered as multicellular organisms ( )
2. Respiratory system consists of a group of different organs that do the function of respiration process ( )
3. The human body contains about 40 million cells. ( )
4. Chloroplasts are found in the cells of banana plant leaves ( )
5. The cells of monkey are surrounded by cell wall from outside ( )
6. Nucleus is found in the center of most cells ( )
7. All cell parts which are found inside the cell are floating in cytoplasm ( )
8. Selective permeability feature takes place through the cell wall ( )
9. Endoplasmic reticulum is collecting and transporting proteins inside the cell to build and repair the cell ( )

10. Mitochondria convert sugar inside the cell into the needed energy to make the cell do its vital processes ( )

11. Cellular respiration takes place inside cells by the help of golgi apparatus.
. ( )

Write the scientific term of each of the following:

1. They are living organisms that their bodies consist of one cell only.

2. They are living organisms that their bodies consist of many cells

3. It is a gelatinous liquid which is found inside the cell

5. It is often located at the center of the cell

6. They are different tiny structures inside the cell and each type of them has a special function

7. They are cell organelles that provide the cell with the needed energy (

B. An organelle which helps in assembling and transporting proteins inside the cell to build and repair the cell

9. An organelle which helps in packing and transporting different materials between the cells and out of the cell

Complete the following sentences

1. Human is considered as……………………….organism, because its body consists of many cells.

2. Muscle tissue is composed of a group of…………… that do the same function

3. Cells of plants is characterized by the presence of chloroplasts which are responsible for making ……………………….process

4. Plant cell similar to animal cell in the presence of cell membrane,……………………, ……………., ………………… endoplasmic reticulum and…………….

5. Cellulose makes up……………. which is found in………… cells only

6. Cells of dog is surrounded by……………. from outside

7. Mitochondria in muscle cells convert………inside the cells into…………………. which is needed for doing different exercises.

8. Transporting proteins inside the cell to build and repair it is the function of…………………., while transporting different materials between the cells is the function of…………………..

Give reasons for

1. Cats are considered as multicellular organisms

……

2. Plant cells can make photosynthesis process.

……

3. Both of endoplasmic reticulum and golgi apparatus are involved in transportation process inside and outside the cell

……

What happens if

1. There is no chloroplasts inside plant cells.

……

2. The cell membrane cannot control the selective permeability feature.

……

3. Sugar doesn't reach mitochondria inside a cell

……

Look at the following figure, then write the correct number beside the suitable sentence

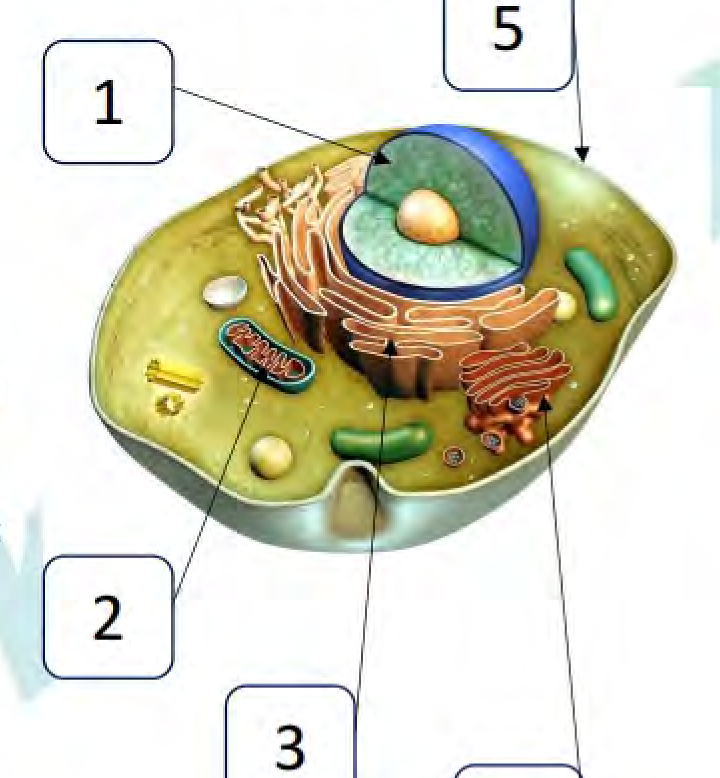
1. Powerhouses in the cell.

2 Control the cell division.

3. Assembling and transporting proteins

4. Control the selective permeability feature.

5. Packing and transporting different materials



Lesson 4.5 exercises

Choose the correct answer :

1. Cellulose forms...................... of plant cell.

a. cell membrane b. cell wall

c. chloroplasts d. sap vacuole

2. The function of cell wall is..

a. surrounding animal cell to give it a definite shape.

b. storing nutrients, water and waste materials inside the cell.

c. surrounding plant cell to give it a definite shape.

d. making food of plants by photosynthesis process.

3. All the following structures are found in onion cells only and not found in fish cells, except.......................................

a. cell wall. b. one sap vacuole.

c. chloroplasts. d. mitochondria.

4. All the following are from characters of chloroplasts, except that............

a. they are sac-like organelles,

b. they contain tiny green granules.

c, they are found in both plant and animal cells.

d. they contain chlorophyll pigment.

5. All the following can be stored inside sap vacuole of plant cell, except

a. energy. b. nutrients. c. water. d. waste materials.

6. The animal cell doesn't have a definite shape, because it doesn't have ....

a. cell membrane. b. cell wall. c. chloroplast, d. nucleus.



7. All the following animals have bones in their bodies, except......................

a. cats. b. dogs. c. birds. d. insects.

8. The animal cell cannot make photosynthesis process, because it doesn't Have............................

a. nucleus. b. chloroplasts. c. mitochondria, d. sap vacuole.

9. The structure which is found in the cell of a banana tree leaf and not found in the cell of a cat is.......................................

a. nucleus. b. golgi apparatus. c. cell membrane. d. cell wall.

10. Most plants appears in......................... color due to the presence of chlorophyll pigment in their cells.

a. yellow b. blue c. green d, red

Put (√) or (X):

1. Cell wall surrounds the cell membrane of animal cells. ( )

2. There is one big vacuole in the cell of onion plant ( )

3. Chlorophyll is responsible for absorbing the energy of sunlight to make the food of plants. ( )

4. The green color of plants is due to the presence of vacuoles in their cells ( )

5. There are many small vacuoles in the cells of a bind ( )

6. Exoskeleton gives some insects their shapes. ( )

7. Calls of human don't have definite shape due to the absence of cell membrane. . ( )

8. The horse can make its own food due to the presence of chloroplasts in its cells.

. ( )

Write the scientific term of each of the following:

1. It surrounds the plant cell to give it a definite shape.

2. A one big sac-like organelle in the plant cell that stores nutrients, water and waste materials

3. They are sac-like organelles that contain tiny green granules and found in plant cells only.

4. It is a green pigment which absorbs the energy of sunlight to make photosynthesis process in plants.

Complete the following sentences:

1. Cell wall is made up of……………… and gives the plant cell its definite……………….

2. Plant cell contains one big………………. which stores nutrients, water and waste materials, while animal cell contains many small…………. which do the same function as in plant cell

3. Apple tree leaves can make photosynthesis process due to the presence of…………………… in its cells

4. The presence of …………….. pigment gives most plants their green color

5. Chlorophyll absorbs the energy of………………………….. food to allow the plant makes its own by ……………..process.

6. Cells of animals don't have definite shapes due to the absence of……………………….

7. The body of a bird has. ……………………. that give this bird its definite shape.

Give reasons for:

1. Plant cell has a definite shape

....

2. Chlorophyll absorbs the energy of the sunlight.

....

3. Mitochondria act as electrical power stations in cities.

....

4. Vacuoles act as storehouse in cities.

....

What happens if...

1. The animal cell is surrounded by cell wall

....

2. There is no chloroplasts in plant cells

....

3. There is no bones found in the body of the cat

....




- Doctors to treat cancer which is caused by cells that divide too quickly.

Check your understanding

قام العلماء ببناء مجهر يظهر الخلية في 30 ، مما يعني أنه يمكنهم رؤية الجزء العلوي والجوانب والطبقات من الخلية ، حيث:

-المجهر 3 d يأخذ صورا لخلية في طبقات

-ثم ، جهاز كمبيوتر يضع هذه الطبقات معا.

-أخيرا ، تتم إضافة الألوان إلى الصورة المشكلة

3د المجهر يمكن أن تساعد:

-علماء الأحياء الخلية معرفة المزيد عن مكونات الخلية وكيف تنقسم الخلايا.

-الأطباء لعلاج السرطان الذي تسببه الخلايا التي تنقسم بسرعة كبيرة.

تحقق من فهمك

Lesson 6 exercises

Choose the correct answer:

1. Cell biologists use microscopes to magnify…………… to appear larger

a. stones b. bricks c. cells d. rocks

2. Cell biologists do experiments and analyze data to study all the following.

Except…………..

a. how cells respond to different medicines.

b. how rocks are formed on Earth's surface.

c. how cells can work to repair body parts.

d. how plant cells respond to different environmental factors.

3. To see the structure of a cell under microscope we must color by using……………

a. stains. b. water c. sunlight. d. vinegar.

4. Methylene blue dye helps us to see the………… of the cell as a blue area under microscope

a. cytoplasm b. golgi apparatus

c. chloroplasts d. nucleus

5. The 3D microscope can help in all the following, except that it helps…………………

a. cell biologists learning more about cell components.

b. scientists to know how planets revolve around the Sun.

c. doctors to treat some diseases as cancer.

d. cell biologists learning more about how cells divide

Put (v) or (X):

1. Cells are very large, as the diameter of an animal cell is about 0.001 ( )

2. Cell biologists are scientists who study rocks ( )

3. Cell biologists work in laboratories and do experiments to study how cells work inside living organisms. ( )

4. Cells are usually dear and colorless, so it is easy to see their structures under microscope. ( )

5. The 3D microscope can help doctors to treat cancer disease. ( )

Write the scientific term of each of the following:

1. They are scientists who study cells.

2. A stain that is used to color the nucleus of the cell in blue color.

3. The microscope that helps us to see the top, sides and layers of the cell

Complete the following sentences using the words below:

(methylene blue-microscope- agriculture-cell biologists-doctors)

1. Cell biologists use ……………………to magnify cells of bacteria.

2. Cell biologists work in……………… to study plant cells and their respond to different environmental factors

3. Cell biologists work with …………… to watch how cells can work to repair the human body parts

4. To see the nucleus of a cell under microscope, we can stain the cell with…………….

5. The 3D microscope can help……………………… learn more about how cells divide

Give reasons for:

1. Some cell biologists work with doctors.

………

2. We must stain cells before examining them under microscope

………

What happens if...?

We stain a sample of cheek cells with methylene blue dye

………

Exercises on Lesson 1

1- Choose the correct answer:

1.When you feel nervous, your heartbeats increase, this indicates the interaction between……………………….systems.

a. digestive and nervous
b. digestive and circulatory
c. nervous and circulatory
d. digestive and respiratory

2.Skeletal system takes nutrients from system for growth of muscles

a. circulatory
b. digestive a hot cup of tea
c. nervous
d. respiratory

3. When you touch…………………system sends a message to the muscles of your hand to contract.

a. respiratory
b. digestive
c. circulatory
d. nervous

4. In a dangerous situation, your eyes send the information to the………………to perform the suitable action.

a. brain
b. stomach
c. Lungs
d. heart

5. Muscles of stomach and muscles of heart can be controlled by..........system.

a. digestive
b. circulatory
c. nervous
d. respiratory

6. The nerve cells depend on…………………systems to get their needed nutrients.

a. digestive and respiratory
b. digestive and circulatory
c. circulatory and respiratory
d. circulatory and nervous

7. The system which transfers nutrients from the digestive system to the different muscles of the body is the ……………….system.

a. Circulatory
b. nervous
c. respiratory
d. excretory

8. In dangerous situations,................................

a. all systems of the body interact together.

b. circulatory system interacts with digestive system only.

c. nervous system sends message to digest food in stomach

d. respiratory system interacts with circulatory system only

1- Put (v) or (x):

1. All systems in your body work together in an integrated way. ( )

2. When you hear a clock alarmyour brain sends a signal to the muscles to move and wake up. ( )

3.In dangerous situations, nervous system only allows your body to face the danger. ( )

4. Digestive system can digest food without the help of nervous system. ( )

5. Muscles of heart are controlled by nervous system. ( )

6. Nutrients reach the nerve cells which found in your hand by the help of circulatory system. ( )

7. Digestive system transfers oxygen gas to all muscles in your body. ( )

3- Complete the following sentences using the words below:

(body systems -blood-nervous-nutrients - muscles - brain)

1- When you feel nervous, there is an interaction between circulatory……..system

2-When you touch a sharp thorn, your hand moves away quickly due to the interaction between nervous system and……………………..in your hand

3- When you smell a fire smoke, the……………………….sends a message to your leg muscles to walk toward the fire location.

4- The interaction between……………. important in any dangerous situation

5- Digestive system provides the nerve cells with…………. which are needed to perform their functions.

6- Nutrients are transmitted from digestive system to nervous system through

the.................... the circulatory system

4-Give reasons for:

1. Digestive system helps skeletal system in fracture healing.

....

2. The nerve cells in the nervous system need nutrients.

....

3. The importance of nervous system for the muscles of heart.

....

5- What happens to...?

The brain of a cyclist when he sees a dangerous situation.

....

Lesson 2 exercises

Choose the correct answer:

1. Cells differ from each other in……………………

a. shapes only. b. sizes only.

c. shapes and sizes. d. neither shapes nor sizes

2. All the following are from the characteristics of muscle cells, except that they….

a. are in the form of long fibers.

b. can work alone due to their large sizes.

c. must be able to store and use energy quickly.

d. can be bundled together to form tissues.

3. The muscle is considered as.......................

a. a cell. b. a tissue. c. an organ. d. a system.

4. Among the organs of musculoskeletal system are……………………

a. muscles and bones of arm. b. muscles of arm and lungs.

c. bones and heart.

d. lungs and heart.

5. Musculoskeletal system allow the body to……………………

a. digest food. b. move from place to another.

c. transmit nutrients. d. exchange oxygen and carbon dioxide.

6. Your leg moves due to contraction and relaxation of…………………… connected to the bones of leg.

a. hairs b. toes c. skin d. muscles.

7. When the muscle in front of the upper arm contracts and the muscle in the back of the upper arm relaxes, the forearm moves. ……………………

a. up towards your shoulder, b. down towards your shoulder.

c. up away from your shoulder. d. down away from your shoulder.

8. When the muscles in front of the upper arm relax and the muscles in the back of the upper arm contract, the forearm moves. ……………………

a. up towards your shoulder. b. down towards your shoulder.

c. up away from your shoulder. d. down away from your shoulder.

9. The contraction of muscles moves the bones in…………………… only.

a. one direction b. two directions

c. three directions d. four directions

10. You can move your fingers due to the contraction and relaxation of the skeletal muscles that attached to the of ……………… your fingers.

a. hairs c. skin d. nails b. bones

11. All the following organs belong to musculoskeletal system, except………………

a. tendons. b. cartilages. c. veins. d. bones.

Choose from column (B) what suits it in column (A):

A	B
1. A group of similar cells form 2. A group of different tissues form 3. A group of different organs form 4. A group of different systems form	a, organs. b. cells. c. whole body. d. tissues e. systems.

1……………… 2……………… 3……………… 4………………

Put (√) or (x):

1. A group of different tissues can form a system ( )

2. Muscle cells are in the form of long fibers to allow movement. ( )

3. Muscle cells cannot store and use energy quickly. (   )

4. The muscle is formed from bundles of muscle tissues. (   )

5. Musculoskeletal system consists of muscular system and digestive system. (   )

6. The body can move by the help of the skeletal system only. (   )

7. The forearm moves up towards your shoulder when the muscle in front of the upper arm contracts. (   )

8. Contraction and relaxation of leg muscles allow the bones of leg to move (   )

9. Musculoskeletal system consists of muscles and bones only. (   )

Write the scientific term of each of the following:

1. They are cells in the form of long fibers to allow movement.

2. It is the organ which contracts and relaxes to help in the movement of the body.

3. The system which helps the body to move.

4. They are muscles that attached to the bones of skeletal system.

Complete the following sentences:

1. The body consists of a group of…………………… which consists of a group of organs

2. Skeletal muscles can store and use…………………… quickly.

3. Bundles of muscle tissues are organized to form the……………………

4. Musculoskeletal system consists of two systems which are …………………… system and…………………… system that allow the…………………… of the body.

5. When you lift a bag by your hand toward your shoulder, muscles in front of the upper arm…………………… and muscles in the back of the upper arm……………………

6. When a muscle contracts, it can exert.......................

7. When you push a door with your hand, the skeletal muscles that found in your arm work in pairs and move in....................... directions

Give reasons for:

1. Muscle cells are in the form of long fibers.

2. Muscle cells don't work alone.

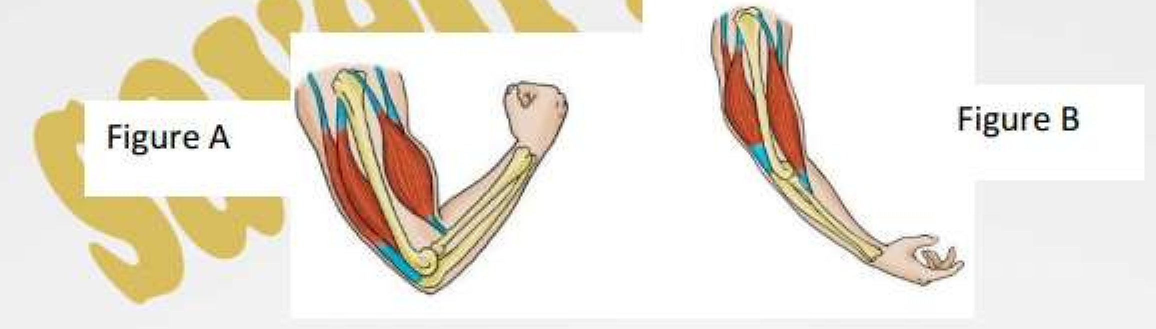
3. Skeletal system cannot do the function of movement without muscular system.

What happens to...?

1. Your leg if the muscles found in it are damaged.

2. The muscles in front of the upper arm and muscles in the back of the upper arm when the forearm moves down away from your shoulder

Look at the following figures, then complete the following sentences:



1. The forearm in figure...................... moves up toward your shoulder.

2. The forearm in figure..................... moves down away from your shoulder.

3. The muscles in front of the upper arm contract in figure. ....

and relax in figure ....

4. The muscles in the back of the upper arm contract in figure. .... and relax in figure.........

Lesson 3 exercises

Choose the correct answer:

1. Among the muscles which you cannot control their movement are………………

a. hand muscles. b. eyelid muscles.

c. leg muscles. d. arm muscles.

2. Cardiac muscles are type of involuntary muscles which form the.. ………………

a stomach. b. intestine. c. lungs. d. heart.

3. Muscles of heart... ……………… to pump the blood carrying oxygen to all body cells.

a. contract only b. relax only

c. contract and relax d. neither contract nor relax

4. Among the organs which contain both involuntary and voluntary muscles is

The ………………

a. heart. b. arm. c. eye. d. leg.

5. Skeletal muscles work in pairs when... ………………

a moving your hands towards your shoulder.

b. pumping blood to all the body parts.

c. transmitting food to all the body parts.

d. closing your eyelid to allow you blink.

6. The system which helps your body gets ready to respond in different situations by secreting hormones is the.. ………………..system.

a. digestive b. endocrine c. circulatory d. nervous

7. Among the functions of endocrine system is………………..

a. transmitting food to the nervous system,

b. controlling the muscles of stomach.

c. controlling the body temperature and blood pressure.

d. providing the muscular system with its needed food.

8. All the following are happened by the help of endocrine system to face or to run away from danger, except. ……………….

a. contraction of your muscles

.b. Increasing your breathing rate.

c. increasing your heartbeats.

d. digestion of food that you eat.

9. All the following are from types of blood vessels, except......

a. arteries. b. heart. c. veins. d. blood capillaries.

10. Circulatory system can transport all the following substances through all the body parts, except……………….

a. nutrients. b. gases. c. hormones. d. bones.

11. When you face a dangerous situation, circulatory system do all the following. except……………….

a. your heartbeats increase. b. muscles of your body relax.

c. heart pumps more blood to the muscles. d. the blood pressure increases.

12. Among the organs which belong to respiratory system is……………….

a. stomach. b. heart. c. lung. d. brain.

13. The system which provides your body with oxygen gas and gets rid of carbon dioxide gas is system.

a. respiratory b. nervous c. endocrine d. circulatory

14. The lungs take in air when the diaphragm………………, while they release the air when the diaphragm. ………………

a. contracts-contracts.
b. contracts-relaxes.
c. relaxes – relaxes
d. relaxes-contracts.

15. The system which helps the respiratory system in transporting oxygen gas from lungs to all the body organs is the ………………system.

a. digestive
b, nervous
c. endocrine
d. circulatory

16. All the following muscles work in pairs as one muscle contracts, while the other muscle relaxes, except the………………

a. upper arm muscles.
b. cardiac muscles.
c. neck muscles.
d. forearm muscles.

Put (√) or (x):

1. Cardiac muscles are considered as voluntary muscles. ( )
2. Heart is made of a type of involuntary muscles known as skeletal muscles. ( )
3. Cardiac muscles contract and relax all the time without stopping. ( )
4. The muscles that help you move your eyes in different directions are considered as voluntary muscles. ( )
5. All skeletal muscles are considered as involuntary muscles and work by contraction. ( )
6. Endocrine system secretes hormones that control the increasing of your breathing rate during danger. ( )
7. The heart begins to beat quickly during normal situations. . ( )
8. When the heartbeats increase, the blood pressure increases also. ( )
9. Trachea is the only airway through which oxygen passes to reach the lungs.( )

10. In dangerous situations, the body sends more oxygenated blood to the muscles and brain to face the danger. ( )

11. Blood transports oxygen gas only to all the body organs and tissues. ( )

12. Forearm muscles are considered as voluntary muscles. ( )

Write the scientific term of each of the following:

1. They are muscles that move automatically and you cannot control their movement.

2. They are muscles that you can control their movement.

3. A type of involuntary muscles which form the heart that contract and relax all time without stopping.

4. They are muscles which allow the movement of the bones of skeletal system.

5. It is the system that secretes hormones to control the body temperature and the blood pressure

6. It is the system which consists of the heart and blood vessels

that allow blood to flow through the body.

7. It is the system which consists of kings and other airways.

Complete the following sentences:

1. Muscles of eyelid that allow you blink many times in one minute are considered as………………. muscles, while the muscles that help your eyeball to move in different directions are considered as. ………………. muscles.

2. The muscles of heart are called ………………. muscles and they are considered as a type of………………. muscles

3. All muscles can do the function of movement by……………….

4. Endocrine system consists of ……………….which secrete ………………. that control body temperature and blood

5. In dangerous situations, endocrine system secretes hormones which allow your ……………….contract and increasing the rate of your………………. and……………….

6. In dangerous situations, heart pumps more blood which carries ……………….. , ……………….and………………. to the muscles and other organs.

7. The lungs release the air that rich in……………….gas, when the………………. muscle relaxes.

8. When your heartbeats and breathing rate increase, your body sends more ………………. blood to the muscles and brain to face the danger.

9. Among the skeletal muscles that you can control their movement are upper arm muscles, ………………. and……………….

Give reasons for:

1. Cardiac muscles are considered as involuntary muscles.

……………………………………………………………………………………………………….

2. Cardiac muscles contract and relax without stopping.

……………………………………………………………………………………………………….

3. The muscles that surround the eyeball are considered as voluntary muscles.

……………………………………………………………………………………………………….

4. When the body faces a danger, the heartbeats increase

……………………………………………………………………………………………………….

What happens to...?

1. The human body if the cardiac muscles don't contract and relax for a long period of time.

2. The human body when the heartbeats increase during danger.

3. The lungs when the diaphragm muscle contracts

Lesson 4 exercises

Choose the correct answer:

1. The systems of the human body get their needed energy from……….

a. the Sun. b. water. c. food. d. carbon dioxide.

2. All the following are from the nutrients that the food contains, except……….

a. carbohydrates. b, oxygen gas. c. fats. d. proteins.

3. The system which converts the complex food into simpler substances that the body can use for energy and growth is the ……….system.

a. respiratory b. nervous c. circulatory d. digestive

4. The system which helps the digestive system during chewing the food by secreting enzymes in your mouth is the... ………. system.

a. endocrine b. circulatory c. respiratory d. nervous

5. The function of saliva inside your mouth is……….

a. cutting up the food into smaller parts.

b. softening the food and breaking it down.

c. transporting the food into stomach.

d. transporting the food through body organs.

6. The organ which belongs to the digestive system and secretes fluids contain an acid and some enzymes is the……….

a esophagus. b. stomach. c. small intestine. d. mouth

8. In small intestine, ……….help(s) in breaking down of food by secreting some enzymes.

a. pancreas only b. gallbladder only

c. pancreas and gallbladder d. pancreas and lungs

9. Absorption of nutrients inside the body starts in the........organ.

a. large intestine b. small intestine c. heart d. stomach

10. Walls of small intestine contain ....which responsible for absorbing nutrients of digested food.

a. blood vessels b. hairs c. glands d. nephrons

11. blood carries.......... formed inside small intestine to all the body organs.

a feces. b. undigested food c. bones d nutrients

12. The large intestine absorbs..........from the undigested food.

a. nutrients b. water c. blood d. urea

14. The organs which can store glucose and convert it into glycogen are..........

a. liver and pancreas. b. muscles and stomach.

c. esophagus and stomach, d. liver and muscles.

15. The system which helps the digestive system in transporting the nutrients

to all different body organs is the...................system.

a. nervous b. respiratory c. circulatory d. excretory

16. The body gets rid of waste materials by..........process.

a. digestion b. excretion c. respiration d. sensation

17. The excretion process is necessary to....

a. digest the food that you eat b. allow your body to move.

c transport the nutrients inside your body. d. remove the waste products from your body.

18. All the following are responsible for excretion process, except..........

a. digestive system. b. skin. c. respiratory system. d. urinary system.

19. The organ which is responsible for secreting sweat is the……….

a esophagus. b. stomach. c. skin. d. kidney.

20. All the following are from the waste materials which are produced by your body, except ……….

a. urine. b. oxygen gas. c. carbon dioxide d. sweat.

21. Among the organs which belong to urinary system are ……….

a. stomach and kidneys. b. ureters and gallbladder.

c. kidneys and bladder. d. urethra and heart.

22. The two kidneys play an important role in the filtration of ……….inside your body.

a water b. enzyme c. acid d. blood

23. The blood which carries the waste materials, enters each kidney through

a large a vein. b. artery. c. blood capillary, d. ureter.

24. Urea is formed due to the breaking down of... ………. inside the body cells.

a. carbohydrates b. fats c. acids d. proteins

25. The tube which transports the urine from the kidney to the bladder is the………

a. vein. b. urethra. c. ureter. d. artery.

26. The process of expelling urine from the body is called……….. process.

a, urination b. respiration c. digestion d. sensation

Put (V) or (X):

1. Systems get their needed energy from the food we eat. ( )

2. The simple substances must be converted into complex nutrients to be used by the body cells. ( )

3. Digestion begins when the food enters esophagus. ( )

4. Saliva is a liquid which is secreted by endocrine system inside your mouth. ( )

5. The acid and enzymes which are secreted inside stomach lead to more breaking down of food. ( )

6. Inside large intestine, enzymes which are secreted from pancreas and gallbladder help in the chemical breakdown of food. ( )

7. Absorption of digested food starts in the small intestine. ( )

8. The digested food enters the colon as a soupy mixture. ( )

9. Colon absorbs most of water from the undigested food that leaves the body.( )

10. The feces leaves the body through a bony opening known as anus.( )

11. Circulatory system transports the digested food to different body organs. ( )

12. All nutrients that are absorbed from small intestine are stored as fats inside the body. ( )

13. Glycogen is converted into glucose and stored in liver and muscles. ( )

14. When your body needs energy, liver and muscles convert glycogen into glucose again. ( )

15. Excretion process is necessary to convert complex food into simpler substances. ( )

16. If your body doesn't get rid of waste, you will be healthy. ( )

17. The main waste product which is expelled by respiratory system is the urea. ( )

18 The two kidneys remove waste materials from the blood. . ( )

19. Nephron helps in the filtration of blood from urea. . ( )

20. Urine is expelled outside the body through urethra. . ( )

21. Blood cells and proteins are too small, so they can pass through the nephrons of kidneys. . ( )

Write the scientific term of each of the following:

1. The system which converts the complex food into simpler substances that the body can use to get energy.

2. The process of breaking down the complex food into simpler substances.

3. A liquid in your mouth contains an enzyme which helps in digestion process.

4. An organ in which absorption of nutrients starts.

5. The organ which absorbs most of water from the undigested food.

6. The last part of large intestine that stores the feces until it leaves the body.

7. A substance that is stored in liver and muscles, then converted into glucose when your body needs energy.

8. It is a system that is responsible for storing and getting rid of waste materials produced from cells.

9. It is the process of removing the waste products resulting from burning food inside the body cells through their membranes.

10. The organ which helps in excretion of sweat through the pores that are found in it.

11. The system that is responsible for excretion of carbon dioxide gas.

12. It is a microscopic filter that is found in the two kidneys and filters the blood from waste materials.

13. A substance which is formed due to the breakdown of proteins inside the body cells.

14. It is the process of expelling urine from the body.

Complete the following sentences:

1. The food we eat contains different nutrients such as…………………… and …………..

2. Your body cells can use simple substances that are converted from complex ………….. to get their needed...... to do their functions.

3. The system which helps your teeth and jaw move to chew the food is

the…… system.

4. Stomach contains an………….. and some………….. that lead to more food breakdown.

5. Inside small intestine, ………….. and …………..secrete enzymes to help in the chemical breakdown of food.

6. After completing the digestion of food, the walls of ………….. absorb the nutrients through ………….. that carry them to all the body parts.

7. Undigested food passes to………….. Intestine which absorbs most of…………..

from it, leaving the solid waste that is known as………….. or …………..

8. The muscular opening that the feces passes through it to outside the body is known as…………..

9. Cells can use …………..sugar at once to get their needed energy, and this sugar can be converted into. ……………. and stored in liver and…………..

10. Excretion process happens when …………..system collects the waste

materials produced by………….. and expels them outside the body.

11. Some waste products leave your body in the form of………….. Through your skin.

12. Respiratory system removes …………..gas from the body as a waste product.

13. Urinary system removes waste material from the blood in the form of…………

14. Blood which carries waste materials reach the kidney through a large...........

15. Filtration of blood occurs inside the………….. by the help of a microscopic filter known as …………..

16. When you eat a piece of meat, proteins are broken down and form a waste material known as……………

17. Urine is composed of……………, other waste products and ……………

Give reasons for:

1. The body needs to convert complex food into simpler substance.
2. Saliva plays an important role in digestion of food inside the mouth.
3. Stomach secretes a digestive fluid when the food reach i
4. Walls of small intestine contain blood vessels.
5. Undigested food becomes solid wastes inside the large intestine.
6. The liver and muscles convert the stored glycogen into glucose sugar.
7. Importance of excretion process to your body.
8. The digestive system doesn't share in excretion process.
9. The two kidneys contain many nephrons.
10. Formation of urea inside the body of human.

What happens if...?

1. Complex nutrients don't convert into simple substances inside your body.
2. Saliva is not secreted during chewing the food inside your mouth.
3. Pancreas and gallbladder don't secrete their enzymes in small intestine.
4. Your body doesn't get rid of waste.
5. The blood that carries waste materials passes through nephrons of the two kidneys.

Lesson 5 exercises

Choose the correct answer :

1- Engineers design special devices to work instead of.........organ which filter the blood from waste materials.

a. stomach b. heart c. kidney d. lung

2. Nephrons play an important role in ....

a. secreting hormones to control the body functions.

b. controlling the movement of body from place to another

c. breaking down the complex food into simple nutrients.

d. filtering the blood from waste materials.

3-Among the substances which cannot pass through the kidneysnephrons are

a. blood cells and urea. b. proteins and urea

c. blood cells and proteins d. water and urea.

4. Urination process happens by the help of....................system

a. digestive b. urinary c. respiratory d. skeletal

5-The two kidneys remove waste materials ....and expel them in the form of urine.

a. water and urea b. urea and blood cells

c. water and proteins d. proteins and blood cells

Put (v) or (x):

1. Kidneys are considered as a filtering system for the blood. ( )

2. People whose kidneys are not working properly must use other devices to filter their blood from waste. ( )

3. Proteins can pass through nephrons during filtration of blood in thetwo kidneys. ( )

5. Studying a kidney model can save time, money and effort. ( )

6. The two kidneys remove waste materials from undigested food which come out in the form of urine. ( )

Complete the following sentences using the words below:

(kidney model - proteins - blood - urine - nephrons - urea)

1- People whose kidneys are not working well, their………………cannot be filtered well.
2- Some substances can pass through nephrons as…………………. while other substances cannot pass through nephrons as………………………
3- The microscopic filters which are found inside the two kidneys are called……………………..
4- We can save people's life when studying a…………………..instead of a real kidney.
5- Waste materials that are removed by the help of urinary system are coming out in the form of…………………………..

Give a reason for :

Blood cells and proteins cannot pass through the kidney's nephrons.

……

What happens if …?

The blood does not pass through the two kidneys during its circulation inside the human body.

…….

• An insulin pump is a device attached to the body to help diabetics control the blood sugar levels with automatic injections of insulin.

Note

Researchers are now working to develop an artificial pancreas, so people infected with diabetes don't need the external pump.

•This artificial pancreas will be an internal organ that pumps insulin as needed.

Lesson 6 exercises

Choose the correct answer:

1. Diabetes disease occurs due to a disturbance in one organ of……… system.

a. respiratory b. nervous c. endocrine d. urinary

2. The organ which is responsible for secreting insulin hormone is the...

a. gallbladder. b. pancreas. c. liver. d. stomach.

3. Insulin hormone is responsible for regulating the level of………in blood.

a. proteins b. fats c. water d. sugar

4. Pancreas belongs to ………system and its secretions help in completing ……… process.

a. endocrine-digestion b. circulatory-respiration

d. endocrine-sensation c. digestive urination

5. People who suffer from diabetes can use the insulin pump device that injects the body automatically with.. ………

a sugar. b. water. c. insulin. d. carbohydrates

Put (√) or (x):

1. Diabetes disease is one of the disorders of the respiratory system. ( )

2. Pancreas secretes hormone to regulate sugar level in the blood. ( )

3. If pancreas cannot do its function correctly, the sugar level in blood doesn't affect. ( )

4. The body uses sugar to get its needed energy. ( )

5. The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. ( )

6. Researchers are working to develop an artificial pancreas instead of the insulin pump device. ( )

Write the scientific term of each of the following:

1. The organ that is responsible for regulating the sugar level in blood

2. A hormone that controls the level of sugar in the human blood.

3. The system which helps in regulating sugar level in the blood by secreting a specific hormone.

4. A device that is used by diabetics to help them control the blood sugar levels with automatic injections of insulin.

5. A disease that is resulting from the disorder of secreting insulin hormone by pancreas.

Complete the following sentences using the words below:

(insulin pump-endocrine pancreas-blood-diabetes-insulin-energy)

1. People that have a problem in secreting insulin hormone will be infected by ……………………..disease.

2. Pancreas is one of the organs of……………………. system that produces……………………. hormone.

3. Insulin regulates the sugar level in the…………………….

4. Diabetics can control the blood sugar levels by using ……………………. automatic injects the body with insulin, device which

5. Researchers are working to develop an artificial …………………….to pump insulin internally inside the human body.

6. The human body uses sugar to get its needed……………………. for doing all vital activities.

Give a reason for :

Diabetics must give themselves regular shots of insulin.

………

What happens if...?

Pancreas doesn't make its function correctly.

………

Give Reason

1- The cell needs energy
To carry out all its life activities and survive

2- The cell allows water to go outside it
To keep the water balance on both sides of the cell membrane

3- You cannot see the body of a bacteria with your naked eye
Because it consists of only one cell that cannot be seen by naked eyes

4- Scientists tend to use microscope in their research
to discover more information about the cell and exchange these information

5- We must rotate the coarse focus and fine focus during examining a sample under microscope
To see a clear image for the sample under the microscope

6- Cats are considered as multicellular organisms
Because their bodies consist of many cells

7- Plant cells can make photosynthesis process
Because they have chloroplasts on plant cells

8- Both of endoplasmic reticulum and Golgi apparatus are involved in transportation process inside and outside the cell
Because endoplasmic reticulum transports protein inside the cell and Golgi apparatus transports different materials between the cells and out of the cell

9- Plant cells have a definite shape

Because the plant cell is surrounded by cell wall which gives it the definite shape

10- Chlorophyll absorbs the energy of the sunlight

To make the food of the plant through the photosynthesis process

11- Mitochondria act as electric power stations in cities

Because they provide the cell with its needed energy

12- Vacuoles act as storehouses in cities

Because they store nutrients, water, and waste materials

13- Some cell biologists work with doctors

To watch how cells can work to repair body parts or how cells respond to different medicines

14- We must stain cells before examining them under microscope

Because cells are usually clear and colorless, so it is hard to see them under microscope

15- Digestive system helps skeletal system in fracture healing

Because it provides the skeletal system with nutrients needed for fracture healing

16- The nerve cells in the nervous system need nutrients

To perform their functions

17- The importance of nervous system for the muscles of heart

Because it controls the movements of heart muscles

18- Muscle cells are in the form of long fibers

To allow movement

19- Muscle cells don't work alone

Because the size of the muscle cell is very small

20- Skeletal system cannot do the function of movement without muscular system

Because skeletal muscles that is attached to bones of skeletal system allow bones to move

21- Cardiac muscles are considered as involuntary muscles

Because they move automatically, and you cannot control their movement

22- Cardiac muscles contract and relax without stopping

To allow the heart pumps the blood carrying oxygen to all the body cells

23- The muscles that surround the eyeball are considered voluntary muscles

Because you can control the movement of the eyeball muscles

24- When the body faces a danger, the heartbeats increase

Because endocrine system secretes hormones which cause increasing of heartbeats rate to face danger

25- The body needs to convert complex food into simpler substances

Because the body cells need these simpler structures to get energy and grow

26- Saliva plays an important role in digestion of food inside the mouth

Because saliva softens the food and start breaking down it

27- Stomach secretes a digestive fluid when the food reaches it
To allow more food breakdown

28- Walls of small intestine contain blood vessels
To carry the nutrients to all body parts

29- Undigested food becomes solid mass inside the large intestine
Because the large intestine absorbs most of water from the undigested food

30- The liver and muscles convert the stored glycogen into glucose sugar
To provide the body with its needed energy

31- Importance of excretion process to your body
It collects the waste materials produced by the cells and removes them from the body to keep it healthy

32- The digestive system does not share in excretion process
Because it does not work on the waste materials produced from burning food inside the body cells

33- The two kidneys contain many nephrons
To filter the blood and remove harmful substances from the body

34- Formation of urea inside the human body
Due to the break down proteins inside the body cells

35- Blood cells and proteins cannot pass through the kidney's nephrons
Because blood cells and proteins are large

36- Diabetic must give themselves regular shots of insulin
To regulate the sugar level in blood



What happens

1- If there is much water enters the cell
The cell will swell until it bursts
2- If the cell does not get its needs of nutrients, oxygen, and water
The cell cannot get its needed energy and will die
3- If the number of cells is increased in the body of a baby
The baby will grow
4- If scientists were not invented the microscope
They could not discover more information about the tiny particles and cells
5- If you examine a sample of plant cells using the low power objective lens of microscope
You will see the cells in small size
6- If there are no chloroplasts inside the plant cells
Plant cells cannot make photosynthesis process
7- If selective permeability feature is absent from cell membrane
The cell cannot control the substances that enter or leave the cell
8- If sugar does not reach mitochondria inside the cell
Mitochondria cannot make cellular respiration and cannot provide the cell with its needed energy
9- If the animal cell is surrounded by cell wall
The animal cell will have a definite shape





10- If there are no chloroplasts in plant cells
Plant cells cannot make their own food by photosynthesis process

11- If there are no bones found in the body of the cat
They body of the cat will not have a definite shape

12- If we stain the nucleus of cheek cells with methylene blue
We can see the nucleus of cheek cells as a blue area

13- To the brain of a cyclist when he is exposed to a dangerous situation
The brain sends a signal to the muscles to contract and allow his body to face the danger

14- To your leg if the muscles found in it are damaged
The leg cannot move

15- To the muscles in front of the upper arm and muscles in the back of the upper arm when the forearm moves down away from your shoulder
The muscles in the front of the upper arm relax while the muscles in the back of the upper arm contract

16- To the human body if the cardiac muscles don't contract and relax for a long period of time
The heart cannot pump the blood that carries oxygen to all body cells and the human will die

17- To the human body when the heartbeats increase during danger
The heart pumps more blood to the muscles, the heart and other organs and the blood pressure increases



18- To the lungs when the diaphragm muscle contracts
    The lungs take in the air rich in oxygen gas
19- If complex nutrients don't convert into simple substances inside your body
    They cannot be used by body cells to get energy and grow
20- If saliva is not secreted during chewing the food inside your mouth
    The food cannot be soften and chemical break down will not happen
21- If pancreas and gall bladder don't secrete their enzymes in small intestine
    The chemical breakdown of food will not happen
22- If your body does not get rid of waste
    The body will get sick
23- If the blood that carries waste materials passes through nephrons of the two kidneys
    The blood will be filtered from harmful substances
24- If the blood does not pass through the two kidneys during its circulation inside the human body
    The blood will not be filtered from the waste materials and the body will get sick
25- If the pancreas does not make its function correctly
    The person will be infected with diabetes disease

Science grade 6 quiz 1

Name :..................................

1- Choose the correct answer :

1- The……………………………….. bulding unit of living organisms body

a- Digestive b- cell c- tissue d-organ

2- An unaided human eye can't see all the following except :

a- An onions b- skins cell c- bacterial cell d-bird un ferterilized egg cell

3- The ………………regulate the substance enter or leave the cell

b- Nucleus b- plasma membrane 3- cell well d- cytoplasm

2- Write the scientific term :

1- The basic structural and building units of life ( )

2- They are living organisms and their body consist of only one cell ( )

3- The small device used to see very small object ( )

4- It's a gas which the cell need to get energy and perform its vital activities ( )

5- They control the substance enter or leave cell ( )

3- Give reason :

1 -Bacteria is unicellular organism?

2 -The cell membrane is very important to cell?

4 – What happen :

Too much water enter the cell?

Science grade 6 **quiz 2**

Name :..

Q 1-Write scientific term :

1-The device Robert hooke used to observe the cell ( )

2-Its gelatinous liquid which is found inside the cell ( )

3- they are organelles that provide cell with the needed energy ( )

Q2 –put true or false

1. **Bacteria and rabbit are multicellular organisms ( )**
2. **The human body contain about 40 million cell ( )**
3. **Selective permeability feature through the cell wall ( )**
4. **The body of living organisms that contain complex system ( )**
5. **Mitochondria convert sugar inside the cell into the needed energy to make the cell to do its vital processes**

Q 3- choose the correct answer

1-stomach is composed of a group of different

a- System b- organs c- tissues d- cell

2- the organelles which control substance enter leave

a- Mitochondria b- cytoplasm c- plasma membrane

3-all other cell parts float in

a- Chloroplasts b- mitochondria c- cytoplasm

Q 4- give reason

1. **Plant has definite shape**

2. **Bacteria is unicellular**

Science grade 6 quiz 3

Name:...

Q1 : write scientific term of the flowing :

1-it surround the plant cell to give definite shape ( )

2-it is green pigment which absorbs the energy of sunlight to make photosynthesis process ( )

3- the organelles that provide the cell with needed energy ( )

4- an organelle which help in assembling and transporting protein

( )

5- it's a gelatinous liquid which is found inside the cell ( )

Q2 :put (√) or (×)

1-Respiratory system consists of a group of different organs to do function of respiration process ( )

2- selective permeability feature take place through the cell wall ( )

3- cellular respiration take place inside cell by the help of Golgi apparatus ( )

4- the animal cell is characterized by large sap vacuole ( )

5- both plant cell and animal cell contain cell membrane ,cell wall ,mitochondria ()

Q 3:choose the correct answer :

1-The structure of plant made of cellulose is the ………….

A-cell membrane b- cytoplasm

C-cell wall d –nucleus

2-plant cell has ability to make the photosynthesis process due to the presence of ……. Inside it

a- Chloroplasts b-nucleus c- cell wall d- cytoplasm

3-the structure which is found in the cell of banana tree leaf and not found in the cell of a cat is ……………

a- Nucleus   b- Golgi apparatus   c- cell membrane   d-cell wall

4-all the following are from character of chloroplasts except that………..

a-they are sac like organelles   b-they contain tiny green granules

c-they are found in both plant and animals   d-they contain chlorophyll pigment

Q4 :give reason :

1-mitochondria act as electrical power station in cities?

……………………………………………………………………….

2-vacuoles act as store house in cities ?

…………………………………………………………………………………

3-plant cell has a definite shape

…………………………………………………………………

Q5 :what happen ;

1-there is no chloroplasts in plant cell

……………………………………………………………………………

Q 6:complete:

Plant cell

Animal cell

1. ……………… 2. ……………… 3. ……………… 4. ………………

5. ……………… 6. ……………… 7. ……………… 8. ………………

9. ……………… 10. ………………

score ______

Science grade 6 **quiz 4**

Name : ....

1 (A) Choose from column (B) what suits it in column (A).

(A)	(B)
1. Circulatory system 2. Nervous system 3. Digestive system	a. is the system which responsible for providing the body with its needed nutrients. b. is the system which responsible for exchanging gas. c. is the system which responsible for transmitting nutrients to all the body parts. d. is the system which responsible for controlling the other systems in the body.

1. .... 2. .... 3. ....

(B) Give a reason for the following :

Nervous system helps circulatory system to do its function.

....

2 (A) Correct the underlined words :

1. Respiratory system provides the skeletal system with nutrients needed for growth. (......................)
2. When your eyes see a dangerous situation, the heart sends a signal to the muscles to contract. (......................)
3. Digestive system controls the muscles of heart. (......................)

Put (✓) or (✗) :

1. All systems in your body work together in an integrated way. ( )
2. When you hear a clock alarm, your brain sends a signal to the muscles to move and wake up. ( )
3. In dangerous situations, nervous system only allows your body to face the danger. ( )
4. Digestive system can digest food without the help of nervous system. ( )